

# MILITARY REVIEW

VOLUME XXIX

NOVEMBER 1949

NUMBER 8

*Editor in Chief*  
COLONEL H. R. EMERY

*North American Edition*  
Editor: LT. COL. M. N. SQUIRES; Assistant Editor: CAPT. K. SHERMAN

*Spanish-American Edition*  
Editor: LT. COL. A. F. BRUNO; Assistant Editors: MAJ. J. A. ANDINO,  
MAJ. W. MARTORANI, LT. L. A. MONSERRATE

*Brazilian Edition*  
Editor: MAJ. H. A. HERRERA, *Brazilian Army*,  
Assistant Editors: MAJ. V. P. D. COUTINHO, *Brazilian Army*,  
CAPT. E. C. SANCTOS, *Brazilian Air Force*

*Administrative Officer*  
LT. M. M. SUSINNA

*Production Manager*  
CAPT. R. B. WINNINGHAM

## CONTENTS

THE TANK BATTLES IN LORRAINE .....	Dr. Hugh M. Cole	3
INTEGRATION OF THE ARTILLERIES .....	Brig. Gen. C. E. Hart, <i>USA</i>	17
UNIFIED COMMAND IN THEATERS OF OPERATIONS .....	Lt. Col. E. M. Postlethwait, <i>Inf</i>	23
THE LOGISTICAL PLANNING OF OPERATION OVERLORD .....	Lt. Col. F. A. Osmanski, <i>GSC</i>	31
SOCIOLOGICAL FACTORS IN STRATEGIC INTELLIGENCE .....	Lt. Col. R. C. White, <i>FA</i>	41
THE INFANTRY DIVISION IN DEFENSE—AN ILLUSTRATIVE PROBLEM .....	Lt. Col. S. D. Smith, Jr., <i>FA</i>	46
SALVAGE .....	Lt. Col. J. D. Sams, <i>Ord</i>	56
MILITARY NOTES AROUND THE WORLD .....		63
FOREIGN MILITARY DIGESTS .....		73
<i>Economy and the Conduct of War</i> .....		73
<i>The Battle of Caen</i> .....		79
<i>The Defense of Scandinavia</i> .....		86
<i>Australia's Long-Range Weapons Organization</i> .....		88
<i>Morale as the Basis of Modern Strategy</i> .....		92
<i>The Surrender at Reims</i> .....		96
<i>Bomber Offensive</i> .....		98
<i>British and American Training Methods</i> .....		103
<i>The Belgian Army Education Service</i> .....		107
BOOKS FOR THE MILITARY READER .....		111

MILITARY REVIEW—Published monthly by the Command and General Staff College at Fort Leavenworth, Kansas, in the English, Spanish, and Portuguese languages. Entered as second-class matter August 31, 1934, at the Post Office at Fort Leavenworth, Kansas, under the Act of March 3, 1879. Subscription rates: \$3.50 (U.S. currency) per year in the United States and other countries of the Western Hemisphere; \$4.50 a year in all other countries. Reprints are authorized, provided credit is given the "MILITARY REVIEW," C&GSC, Fort Leavenworth, Kansas.

# OUR AUTHORS



Dr. Hugh M. Cole is chief of the ETO Unit, Historical Division, US Army. Before entering the Army in 1942, he was on the faculty of the University of Chicago. He graduated from the C&GSC in the 12th Class in 1943 and served with the Third Army in England and on General Patton's staff as Historical Officer in four campaigns in Europe. He was Deputy Historian of the ETO from 1945 to 1946. He holds a commission as colonel, ORC.

Brigadier General Charles E. Hart's views on the integration of the artilleries are based on wide experience and knowledge of the Field Artillery and of the AA and Seacoast Branches of the Coast Artillery. He served as II Corps Artillery Officer in Africa and Sicily and as First Army Artillery Officer in Northwest Europe. He became Assistant Commandant of the Antiaircraft and Guided Missiles Branch of The Artillery School in 1947.

Lieutenant Colonel Edward M. Postlethwait wrote "Corps Defense on a Broad Front," which appeared in the July 1949 issue of the MILITARY REVIEW. He was an instructor at the C&GSC from 1947 to 1949 and is now a student at the Armed Forces Staff College.

Lieutenant Colonel Frank A. Osmanski became an Assistant G-4, ETOUSA, in 1943 and had charge of the United Kingdom Supply Section. On the organization of HQ COSSAC, he became an Assistant Administrative Planner there and continued in that and similar positions in SHAEF and USFET. He was engaged in the

logistical plannings for Operation Overlord, post-Overlord operations, and the postwar organization of ETO. Since the war, he has served with First Army, graduated from the C&GSC, served as planner in the Strategy Branch, P&O Division, GSUSA, and held the position of Assistant Secretary General Staff to the Deputy Chief of Staff for Plans and Combat Operations. He is now a student at the Armed Forces Staff College.

Lieutenant Colonel Robert C. White attended the 2d Special Course at the C&GSC in 1941 and had service as a Field Artillery Battalion and Group commander in France, Belgium, Holland, and Germany during the war. He graduated from the Regular Course of the C&GSC in 1947 and has been an instructor in the Department of Intelligence since that time.

Lieutenant Colonel Selwyn D. Smith, Jr., commanded Field Artillery battalions in the Mediterranean and European Theaters during seven campaigns, which included the Anzio operation. He was assigned as an instructor at the C&GSC from December 1945 until 1949 and is now a student at the Armed Forces Staff College.

Lieutenant Colonel James D. Sams was Ordnance Officer of the 4th Infantry Division from 1940 to 1944 and landed with the Division on Utah Beach in Normandy. Shortly after, he became commander of the 52d Ordnance Group, First Army. He graduated from the C&GSC in 1946 and then served as an instructor until 1949. He is now assigned to the Office, Chief of Ordnance.

# The Tank Battles in Lorraine

Dr. Hugh M. Cole

Historical Division, Special Staff, United States Army

*This article is excerpted from a chapter in Dr. Cole's forthcoming book entitled The Lorraine Campaign, one of the volumes in the series, The U. S. Army in World War II, now being produced by the Historical Division, Special Staff, United States Army. Copyright 1949 by Orlando Ward; permission for reproduction may be obtained on request from the Chief, Historical Division, Special Staff, United States Army, Department of the Army, The Pentagon, Washington 25, D. C.—The Editor.*

BY THE middle of September 1944, General George S. Patton's Third Army was being employed in the French province of Lorraine in a continuation of the drive toward the Rhine. At that time, the Third Army left and center was across the Moselle River. On the right, XV Corps was in the process of closing on the west bank of the River.

At various points along the front, the enemy continued to offer spirited and stubborn resistance, but a successful drive by the 4th Armored Division had penetrated deep into the German rear and had indicated that the enemy was not prepared to defend in depth once his linear defenses were broken.

Patton assigned objectives to his Corps

Commanders on 16 September. He ordered XX Corps to continue the advance to seize Frankfurt. XII Corps was directed to continue the advance "rapidly" to the northeast, take Darmstadt, and establish a bridgehead east of the Rhine. XV Corps would remain echeloned to the right rear during the general advance but would be prepared, on General Patton's order, to capture Mannheim or move over the Rhine via bridgeheads belonging to one of the other corps.

Although the Third Army Commander's order for a continuation of the advance applied to all three corps, he expected XII Corps—in the center—to lead off in the initial deep penetration by a further use of the line plunging tactics of the 4th Armored Division. The target date for the XII Corps attack was fixed as 18 September.

The scheme of maneuver was as follows. XII Corps would move in column of divisions. The 4th Armored Division, already deep in enemy territory at Arracourt, would lead the column and strike hard to crack the German West Wall between Sarreguemines and Saarbrücken. If General John S. Wood's armor succeeded in punching a hole, General Paul W. Baade's 35th Infantry Division would follow through, sending one regiment to accompany the

**The Lorraine tank battles of September 1944, during Third Army's continuation of the drive toward the Rhine, showed a high degree of coordination in the attack, and tenacity and skill in defense**

armor and using the remainder to hold and widen the gap. General Horace L. McBride's 80th Infantry Division, heavily engaged in the Dieulouard bridgehead, would remain behind and mop up the enemy in its area; then it would fall into the attacking column, take Saarbrücken, and continue on toward the Rhine. The advance combat command of the 6th Armored Division, CCB, already was enroute from Brittany to the XII Corps front and General Patton promised General M. S. Eddy, XII Corps Commander, that this additional armored weight would be thrown into the attack.

Such was the ambitious scheme for a rapid advance to the Rhine. Meanwhile, however, the enemy already was on the march to launch a counterattack with elements of the *Fifth Panzer Army* which would interrupt the execution of the Third Army plans and effectively contain the 4th Armored Division.

#### The Arracourt Tank Battle 19-22 September

CCB, 4th Armored Division, had been sent north from the Marne-Rhin Canal on 17 September to aid the 80th Division. This move had been cancelled by the XII Corps Commander that same evening upon receipt of orders from General Patton alerting the Corps for an advance northeast toward the Saar River, to be executed in column of divisions with the 4th Armored Division in the lead.

The optimism so prevalent in the Third Army in early September had tempered somewhat, at least among the combat elements, and General Wood phoned the Corps Headquarters to warn that "this job of getting supplies across the river (the Moselle) and on the roads is getting to be a major problem. This will not be a very fast operation—no *blitz*." But at 0030 on 18 September, Wood gave orders for the resumption of the advance on the following day: CCB to move from Delme on

Saarbrücken; CCA to move out from the Arracourt area along the center road in the XII Corps zone (Morhange, Puttelange) and by subsidiary roads on the south flank towards Sarreguemines. News of the German attack at Lunéville on the 18th only partially deranged these plans. CCA, after having sent a task force to aid CCR, was ordered to stand to until the situation at Lunéville was clearer and the task force had returned; but CCB continued planning for an attack toward Saarbrücken on the following day.

On the night of 18 September, the 4th Armored Division was deployed as follows: CCR had beaten off the Lunéville attack, with slight losses to itself, and was awaiting the arrival of the combat command from the 6th Armored Division as relief. CCB was massed near Fresnes-en-Saulnois, and the main body of CCA, somewhat reduced by the Lunéville mission, was assembled around Arracourt, about 12 miles to the southeast. The extended CCA sector, reaching from Chambrey (south of Chateau-Salins) nearly to the canal, could only be thinly outposted on the night of 18-19 September, for there was only a relatively small force at hand: two companies of medium and one of light tanks, a battalion of armored infantry, a battalion of engineers, a company of TD's, and three battalions of artillery. The armored infantry and a company of medium tanks were deployed on the north flank between Chambrey and Arracourt. The combat command headquarters, the field artillery, and a platoon of TD's were grouped in and around the town of Arracourt. The bulk of the engineers held the south flank, withdrawn somewhat towards the west. One medium tank company, Company C of the 37th Tank Battalion (Captain Lamison), formed a combat outpost around the crossroads village of Lezey—between 4 and 5 miles northeast of Arracourt.

Not known as yet was the advance of the German *LVIII Panzer Corps* from Sarre-



bourg, and though just before dark artillery observers had counted some 30 tanks east of Lunéville (the second tank battalion of the *111th Panzer Brigade* had now come up) this threat appeared to be checked by the American reinforcements at Lunéville.

Just before midnight, the CCA outposts near Lezey heard tracked vehicles moving in the darkness to their front. They called for artillery fire and the clanking of the treads ceased. About 0730 on 19 September,

a successful night march, reorganized its advance guard near Ley, and now pushed through the heavy fog towards Bezange. In the meeting engagement which followed, as in the later tank battles, the morning fog common to this area played a dual role—protecting the German armor from air attack, but permitting the American tanks to fight at close quarters where the longer range of the Panther tank gun had no advantage. A section of M-4s were in an outpost position south of Lezey when



An American soldier looks over a German tank which was knocked out during the tank action near Lunéville, France, in September 1944.—US Army photo.

a liaison officer, driving down the road near Bezange-la-Petite, ran into the rear of a German tank column but escaped notice in the thick morning fog and radioed to his battalion commander at Lezey. At about the same time, a light tank platoon had a brush with some German tanks in the vicinity of Moncourt.

The German *113th Panzer Brigade*, with 45 Panther tanks of the MK V Battalion and the *2113th Panzer Grenadier Regiment* in the lead, had moved from Bourdonnay in

the first Panther suddenly loomed out of the fog—hardly 75 yards from the two American tanks. The Panther and two of its fellows were destroyed in a matter of seconds, whereupon the remaining German tanks turned hurriedly away to the south. The liaison officer who had reported the enemy armor arrived at Arracourt and was ordered to take a platoon of the 704th TD Battalion to aid the tanks in Lezey. Just west of Bezange-la-Petite, the platoon saw a number of German tanks moving

through the fog. The TD's quickly deployed in a shallow depression and opened fire at about 150 yards. In the short, bitter fight that followed, three of the four American TD's were lost, but not until they had destroyed seven enemy tanks.

The 113th Panzer Brigade attack developed in a series of consecutive jabs, generally made by a company of tanks and a platoon of infantry, as the enemy probed to find an opening in the CCA defenses. Meanwhile, the American outposts had been drawn in, the company of medium tanks was hurried down from Chambrey, General Eddy sent the task force at Lunéville back to rejoin the command, and the armored artillery ranged in on the attackers.

The superior mobility of the American tanks and self-propelled TD's gave the defenders a decided advantage. When the Panthers turned away, after the abortive attack at Lezey, four tanks from C Company raced the enemy some 3,000 yards to a commanding ridge west of Bezange-la-Petite. Arriving on the position about 3 minutes before eight Panthers appeared, the tanks got set and knocked out four of the German tanks before they could return the fire, then withdrew over the crest of the ridge, moved south a short distance, reappeared and finished off the remaining Panthers.

In the late morning, the German attack turned west toward Réhicourt, attempting to drive around the town, first to the north, then to the south. Here again, the American artillery, tanks, and TD's inflicted severe losses on the enemy armor. A platoon of TD's from the 704th got eight Panthers and drove the rest of an enemy tank company back in flight.

The company of medium tanks which had been sent to Lunéville returned in the afternoon, and CCA was ready to counter-attack. A combined force from Companies A and B, 37th Tank Battalion, wheeled south through Réhicourt, caught the Ger-

mans in the flank, and knocked out nine Panthers, with the loss of only three tanks. As the day ended, the 37th Tank Battalion turned its attention to mopping up the German infantry west of Moncourt, and finally, guided through the night by burning German tanks, assembled in the vicinity of Lezey.

The German armored attack appeared to have spent itself. General Patton, who had come to Arracourt from the Third Army Headquarters at Etain, talked with General Wood and agreed that CCA should begin the push towards Sarreguemines the next morning, reinforced by CCR, which had been relieved at Lunéville during the day by CCB, 6th Armored Division. On the whole, there appeared to be no reason for worrying further about a German threat in the Arracourt sector, since CCA reported that 43 enemy tanks, mostly factory-new Panthers, had been destroyed, and that its own losses had been only 6 killed and 13 wounded with 3 TD's and 5 M-4 tanks destroyed.

On the morning of 20 September, CCA began to move out toward the northeast, leaving one company of the 35th Tank Battalion near Arracourt to cover the concentration of the 320th Infantry (-), CCR, and the 602d TD Battalion, which were moving in to take over the area. To the north, CCB, which had initiated the scheduled attack on the previous day, was fighting in a thick blanket of fog to clear a road through Chateau-Salins, after attempts to by-pass on miserable side roads had bogged down.

At 1130, the head of one column of CCA had reached Hampont and another was closing on Dieuze when General Wood radioed that enemy tanks had returned to the attack near Arracourt and that a task force must be sent back to the scene at once. Actually, only eight German tanks were involved, having made a sortie towards the 191st FA Battalion just as it was ready to limber up and join the march



column. This attack was readily handled by the 155-mm howitzers, firing HE at one thousand yards, and by the appearance of the rear guard tanks and some TD's, which allowed none of the attackers to escape. But the entire CCA turned back to sweep up the entire area "once and for all."

By mid-afternoon, the sweeping operation was under way. A force consisting of three medium tank companies of the 37th and two companies of the 10th Armored Infantry Battalion was assembled near Lezey, while the artillery adjusted its supporting fires, and then drove down on Ley. While this force had been gathering, the Germans had moved to parry the coming blow by dispatching a group of MK IV tanks and 88-mm guns from the *111th Panzer Brigade* reserve to positions on Hill 260 and Hill 241 west of Ommeray. The main American force went through Ley with hardly a shot fired. But C Company, 37th Tank Battalion, which was covering the force flank east of Ley, ran head on into the fire of the German tanks and guns.

Between Ley and Ommeray rise two low hills with a narrow valley between: Manne-court, on the west, and Hill 241, which is slightly higher, on the east. C Company, coming over Mannecourt Hill, met a fusillade from the Germans on the forward slope of Hill 241. In a fire-fight lasting about 3 minutes, C Company lost five or six tanks—but inflicted about the same number of tank casualties on the enemy. Then, the Americans drew back from the crest and waited for B Company to come up. It arrived, the two companies maneuvered into new positions and engaged in a brief tank duel which brought the losses for both sides to some 11 or 12 tanks apiece. Darkness was coming on and the two companies finally turned aside to complete the sweeping operation by a night attack southward, taking Moncourt and then bivouac-ing with their main body back to Lezey.

On CCA's south flank, a small force had been sent during the afternoon to mop up

along the Canal. West of Bures, five Panthers on patrol were destroyed, but when Kimsey tried to move into Bures, the German tanks, fighting from cover, outranged the M-4s and the Americans had to give up the attack.

Throughout the day, CCA had held the initiative, but the additional armored weight given the *LVIII Panzer Corps* by the *111th Panzer Brigade* prevented any clear-cut decision. General Blaskowitz, Commanding General of *Army Group G*, however, was far from satisfied by the events of 20 September and the *Army Group G "War Diary"* noted critically that "the *Fifth Panzer Army* shows a marked tendency to limit itself to defensive action."

The failure to achieve an early and brilliant victory in the armored counterattack had provided Hitler with an excuse to get rid of Blaskowitz, who, although politically suspect, had not become involved in anti-Nazi intrigues and cabals. On 21 September, Hitler relieved General Blaskowitz and gave the command of *Army Group G* to General Hermann Balck.

CCA made another sweep on 21 September, this time south to the Canal past Bures and Coincourt—preceded by air raids over the sector and intense artillery fire. To their surprise, the Americans met little opposition, except some infantry and a few dug-in tanks, for the *LVIII Panzer Corps* had refused its southern flank in conformity with the withdrawal by the right and center. Unaware of the impending German attack, General Wood ordered the 4th Armored Division to take the next day for rest and maintenance, prior to an attack by both combat commands to clean out Chateau-Salins where the garrison thus far had defeated all attempts to take the town and had damaged seven American tanks the previous day. The 9th TD Group and 42d Cavalry Squadron were brought up to hold the ground between Ley and the Canal.

The morning of 22 September was fog-

bound and murky, giving the German assault force protection from the dreaded "Jabo's" (fighter-bombers). But the attack toward Juvelize began nearly 3 hours late because of the tardy arrival of an infantry battalion which had been sent forward by the 11th Panzer Division to relieve the 111th Panzer Brigade, the latter being intended for use in the subsequent attack against Moyenvic. In the first phase of the assault, the blow was taken by the 25th Cavalry Squadron, which was screening CCA's left flank and observing the roads between Dieuze and Moyenvic. During the previous night, German patrols had laid white cord up to the cavalry lines and now the advance guard of the main enemy force, circling around to the north of Juvelize, sneaked in on the squadron with tanks and infantry. In some cases, the German tanks came within 75 yards of the cavalry pickets before they were observed. The thin-skinned cavalry vehicles were no match for the enemy, and seven light tanks were lost in the melee. But C Company of the 704th TD Battalion, in hull defilade behind the center of the cavalry line, succeeded in destroying three of the German tanks. This prompted the rest to turn back to the northeast, leaving the German infantry assault force stranded west of Juvelize.

The sun finally broke through and XIX TAC flew into the area, strafing and bombing, while the 37th Tank Battalion and the 10th Armored Infantry Battalion counterattacked to take Juvelize and break up the German advance. Some of the tanks circled to the northwest and seized the hill at les Trois Croix which looked down into the valley east of Juvelize, along which German reinforcements were moving from the Bois du Sorbier. Fourteen enemy tanks were destroyed here by tank and artillery fire at ranges from 400 to 2,000 yards, and the commander of the 111th Panzer Brigade was mortally wounded. The P-47s broke up the remaining attackers, with the help of the armored field

artillery, and cut them to pieces as they straggled back to the northeast. The urgent pleas of General Manteuffel, Fifth Panzer Army Commander, for help from the *Luftwaffe* remained unanswered and he reluctantly sent his last armored reserve, a few tanks from the 113th Panzer Brigade, east of Lezey to hold astride the Moyenvic-Bourdonnay road. The German attempt to reach Moyenvic had ended in disaster. Only 7 tanks and 80 men were left in the 111th Panzer Brigade when night fell, and a scheduled continuation of the attack by the 111th Panzer Grenadier Regiment, which was marching up from the 11th Panzer Division, was called off as useless.

The tank battles fought from 19 through 22 September had cost CCA 14 medium tanks and 7 light tanks, totally destroyed, and a casualty list of 25 killed and 88 wounded. The German losses cannot be accurately determined, but two Panzer Brigades had been wrecked as combat units—without bringing the Fifth Panzer Army appreciably closer to the Moselle or the 553d Volksgrenadier Division.

#### XV Corps Advance to the Vezouse River 21-24 September

The failure of the Fifth Panzer Army attack north of the Marne-Rhin Canal had a counterpart in the reverses suffered by the XXXXVII Panzer Corps south of the Canal. General Lüttwitz' security line hardly had been established along the lower Meurthe, following the withdrawal from the Mortagne, before the pursuing XV Corps attacked the new river position.

The boundary changes between XV and XII Corps gave General Wade H. Haislip, XV Corps commander, an opportunity to flank the Meurthe line by a turning movement through Lunéville, where the Meurthe bridges were held open by the XII Corps armor. The 313th Infantry, charged with executing this maneuver, detached one battalion at Lunéville—to aid the armor in the street-to-street battle for possession of the

city—and the remainder of the regiment turned southeast to attack along the enemy bank of the Meurthe.

On 21 September, the 313th (—) hit the outposts of the *21st Panzer Division* at the village of Moncel, just outside of the Forêt de Mondon. Moncel was taken. But when the 313th reached the forest, it was brought sharply to a halt by heavy fire from the main German position—a line of fox holes and trenches masked by the woods. General Ira T. Wyche had planned a coordinated attack against the Forêt de Mondon on 21 September as a necessary prelude to an advance on the Forêt de Parroy, so while the 313th probed the German positions on the north edge of the forest, the 3d Battalion of the 314th began a bitter fight to cross the Meurthe River and penetrate the forest from the west. Three companies succeeded in crossing the River near St. Clement, but were met by a hot fire when they moved forward onto the flat, bare plain which here extends some two thousand yards back to the forest. This narrow bridgehead, on the very edge of the Meurthe, could not be maintained, and when night came, the battalion fell back across the river.

On 22 September, General Lüttwitz attempted to ease the growing pressure on his north flank by local counterattacks around Lunéville. At Moncel, three enemy tanks and a small party of infantry broke through the lines of the 313th Infantry and reached the northwest quarter of the town, where they were surrounded and killed or captured. Lunéville continued to be a sore spot for the Americans since it lay adjacent to the Forêt de Parroy, from whose recesses the *15th Panzer Grenadier Division* launched new forays on the city at will. Two battalions of the 315th, which had just been brought up from reserve to take over the city, were hit during the day by an attack that reached the stadium in the northeastern suburbs, but the enemy was again driven out.

The 79th Division continued its drive to dislodge the *21st Panzer Division* and the few remaining tanks of the *112th Panzer Brigade* from the Forêt de Mondon, but with little immediate success. Here, as elsewhere in Lorraine, the veteran German proved himself a skillful and tenacious forest fighter.

At the northern edge of the woods, the 313th Infantry inflicted heavy punishment on the German grenadiers, but could make no real headway. The 314th forded four companies across the Meurthe but found it impossible to move forward any heavy weapons, without a bridge, nor could the infantry attack the German positions in the woods without close-up artillery and tank support. So the advance was halted until a bridge could be built during hours of darkness.

The progress of the 79th Division had been slow on 22 September, but the situation of the opposing *XXXXVII Panzer Corps* was growing more precarious by the hour. On the north flank, the *15th Panzer Grenadier Division*, still minus one of its regiments, was straining to hold between Lunéville and the Canal as a cover for the left flank of the battered *LVIII Panzer Corps*. The *21st Panzer Division*, now hardly at regimental strength, held a line along the east bank of the Meurthe that already had been extended past the breaking point and was almost completely bereft of AT weapons and assault guns. The few tanks left to the *112th Panzer Brigade*, after the debacle at Dompaigne, were nearly used up and it is doubtful if General Lüttwitz had more than a dozen tanks in his entire Corps. Harassed as it was by the evening of 22 September, the *XXXXVII Panzer Corps* received news of still another threat when *OB West* sent radio warning that an American airborne landing could be expected in the rear of the Corps—probably on the following morning. General Manteuffel asked for permission to withdraw the entire *Fifth Panzer Army*,





Above, tanks of the 4th Armored Division cross the National Canal near Bayon, France, on 20 September 1944. Below, with tank support, men of the 37th Infantry Regiment, 35th Division, move across an open field toward a woods during the action near Nancy, France, on 22 September 1944.—US Army photos.



but at midnight General Balck refused, citing "the clear Führerbefehl," that the Army must reach the *553d Volksgrenadier Division* east of Nancy. All the help Balck's headquarters could give was one battalion of AA Artillery, which was sent to Blamont, in the rear of the *XXXXVII Panzer Corps*, for use against the anticipated airborne attack.

This threat of vertical encirclement failed to materialize on 23 September. But the 79th Division began to close on the Forêt de Mondon in a series of hand-to-hand engagements and by noon the enemy were retreating to the east, under such cover as the German batteries in the Forêt de Parroy could provide. Although the Forêt de Mondon had been wrested from the German defenders, and the area between the Meurthe and la Vezouse Rivers freed, the battle had won some time for Lüttwitz and had taken heavy toll among the American battalions taking part. The 3d Battalion of the 314th Infantry, which finally broke the German hold, suffered nearly two hundred casualties in the frontal assault across the Meurthe and lost most of its officers.

#### Continuation of the Tank Battles 24-29 September

Following the German attack on 22 September, the 4th Armored Division was given a day's respite, while the American cavalry scouted to the east and XIX TAC continued to interdict the enemy-held roads and strafe isolated targets designated by the armor. However, prisoners reported that a new attack was in the offing and early on 24 September the blow came—this time delivered by the *First Army* in the sector held by CCB, west of Chateau-Salins.

Two days before, Hitler had repeated his orders that contact must be established with the *553d Volksgrenadier Division*, that all the enemy north of the Marne-Rhin Canal must be destroyed, and—specifi-

cally—that the *First Army* and *Fifth Panzer Army* must join in the Chateau-Salins—Moyenvic sector. To effect this junction, General Rundstedt took the *559th Volksgrenadier Division* from the sector north of Metz, leaving the *462d Infantry Division* to cover the gap by extending its front to the north past Thionville, and assembled it at Morhange, with the *106th Panzer Brigade* in support.

On the morning of 24 September, CCB was concentrated in the area between Chateau-Salins and Fresnes-en-Saulnois, screening in front of the 35th Division and awaiting orders to continue the offensive to the northeast. At dawn, an unusually heavy concentration of artillery fire broke on the command, and enemy tanks and infantry were in on the American positions before the division artillery could be brought to bear. Two regiments of the *559th Volksgrenadier Division* attacked on three sides of the CCB perimeter in a mounting melee.

Shortly after 0830, the main enemy effort was launched against the American right flank by a tank thrust from Chateau-Salins. This coordinated attack threatened to have serious results when, about 1000, the skies cleared and the P-47s came in the fight. In 15 minutes, the attack was broken and the Germans were in flight, leaving 11 wrecked tanks behind them and about 300 dead. Although no further assaults were made, the German artillery, firing from the shelter of the Forêt de Chateau-Salins, continued a heavy shelling all through the afternoon, destroying an American aid station and spraying the area with fragments from time fire. CCB sustained 120 casualties in this action but at the end of the day still held its ground.

Now the *Fifth Panzer Army* prepared to return to the attack.

The fate of the *111th Panzer Brigade* on 22 September had prompted General Manteuffel to seek for surprise on 25 September by moving the axis of his attack

farther to the north. On the night of 24 September, scouting parties reported that Moyenvic was unoccupied and that Marsal was only weakly held. The main attack by the 11th Panzer Division jumped off the next morning at 0900—two hours later than scheduled—because of a steady downpour that slowed up tanks and guns as they moved into position. The thin cavalry screen on the American north flank was easily brushed aside and the enemy seized Marsal, where, under a smoke screen, they reorganized to fan out in attacks toward the south. One prong of the German drive continued through Moyenvic and by noon had come to a halt at Vic-sur-Seille—finally effecting the junction with the First Army which Berlin had decreed.

This quick success on the north flank dictated a widening of the attack, and about 1000 General Manteuffel ordered a general advance along the whole LVIII Panzer Corps front, its object to be the seizure of a line reaching from Moncel-sur-Seille (some 7 miles west of Moyenvic), diagonally through Bezange-la-Grande and Bathelemont, and back to the Canal at Henamenil where the XXXXVII Panzer Corps still held. Manteuffel called on Lüttwitz to support the attack from south of the Canal with counterbattery fire on the American artillery massed behind the hills northeast of Bathelemont. But such an artillery duel could profit the Germans very little, for it is doubtful if Lüttwitz had a score of guns available in his entire Corps. The German assault Corps had a fair number of artillery pieces, but, just as in the case of the relative armored strength, the American superiority was pronounced, at least six field artillery battalions being brought into play during the course of the battle.

At noon, the enemy began to shoulder his way against CCA's north flank in an attempt to widen the corridor of assault. Ten tanks rolled down from the north and hit the 37th Tank Battalion, northeast of

Juvelize, but were handily beaten off by the American M-4s, which outnumbered them and held positions on the slopes above the German line of approach. Next, infantry in about battalion strength, reinforced by a few tanks, tried to drive in the outpost lines manned by the 10th Armored Infantry Battalion (southeast of the 37th Tank Battalion), the 25th Cavalry, and the 53d Armored Infantry Battalion, the latter two holding on the north flank along a line running west. These attacks continued sporadically throughout the afternoon and evening in a continuous rain which curtailed off the battle ground and left the decision to men, tanks, and guns. The enemy occupied Moncourt, but elsewhere the Americans held their ground and blunted the spearhead of the German drive by successful counterattacks.

During the night, General Wood moved CCB down to take over the line of the 320th Infantry (—) between Réhicourt and the Canal, on the right flank of CCA, while the 35th Infantry Division occupied the former CCB sector west of Chateau-Salins. On 26 September, the 4th Armored Division reorganized its front, by a slight withdrawal to the west, as part of the shift to the defensive which had been ordered for the Third Army. General Manteuffel seized the opportunity offered by the American withdrawal to report the uncontested occupation of Juvelize and Coincourt as "victories." He then prepared to resume the attack toward the west.

Manteuffel switched the direction of the LVIII Panzer Corps attack on 27 September so as to bring his main force to bear against the American south flank. An armored task force of about 25 tanks was scraped together from the 11th Panzer Division, 15th Panzer Grenadier Division, and the two Panzer Brigades. These tanks, reinforced by the reconnaissance battalion of the 11th Panzer Division, which had just come up from the Nineteenth Army front, were given the mission of making

an envelopment by a march along the narrow road between the Canal and the Etang de Parroy—following this by an attack to take the dromedary-back, at Hills 318 and 293, and Arracourt.

Both Manteuffel and Balck were gravely concerned with the American possession of this dromedary-back plateau, east of the Arracourt-Bathelemont road, since its two hills rose to command long reaches of the ground held by the *Fifth Panzer Army*. The attack on 27 September, then, would be a fight to deny the Americans the observation which, coupled with their superiority in artillery, effectively barred the road to Nancy. General Wietersheim, *11th Panzer Division* Commander, opposed this new plan, for his experience with American planes and artillery during the retreat from Southern France dictated the dispersal rather than the concentration of tanks in attack. But Manteuffel, still thinking in terms of his experience with massed armor on the Eastern Front, was adamant—in addition he had been promised that 50 planes would fly cover over his tanks during the attack.

At 0800, the *LVIII Panzer Corps* (minus the armored task force) began a series of bitter diversionary attacks along the left and center of the 4th Armored Division perimeter. A battalion of grenadiers and a few tanks struck with particular fury against the 10th Armored Infantry Battalion which had been withdrawn to the new MLR and had taken over the sector between Bezange-la-Petite and Réchicourt. The battalion occupied a front of some 3,500 yards. Its left flank extended tenuously beyond the edge of Hill 265, west of Bezange; between its right flank and the 51st Armored Infantry Battalion, a gap existed which neither of the battalions had the rifle strength to fill. The German assault bent the thin American line but could not break through. At Hill 265, the enemy succeeded in gaining a foothold, but at this point 1st Lt. James H. Fields in-

spired his men to stand fast, though he had been rendered speechless by wounds in the head and throat. When two German machine guns caught the Americans in a withering cross fire, Fields took up a light machine gun from its dead crew and knocked out both of the German weapons. For gallantry in this action Lt. Fields received the Congressional Medal of Honor. On the north flank, the *110th Panzer Grenadier Regiment* got its troops as far as Xanrey. But while the Germans were reorganizing for a continuation of the attack, some American tanks entered the town, under cover of smoke and artillery fire, and killed about 135 of the grenadiers—abruptly terminating this phase of the enemy maneuver.

About 1000, Manteuffel's armored task force commenced the main attack, but its advance guard had gone only as far as Fourasse Farm, some 1,800 yards west of Bures, when the American artillery brought the tanks to a halt.

During the night, General Wietersheim switched the *110th Panzer Grenadier Regiment* around from the north flank and put it in on his south flank to reinforce the tank group. One of its combat patrols succeeded in filtering through to the north of the farm and captured Hill 318 after a sharp fight. Hill 318, and the plateau from which it projected, now became the focal point for the whole German effort. At daybreak on 28 September, the 51st Armored Infantry Battalion retook the hill, but the fight continued through the morning, surging back and forth on the crest. About noon, the 51st got a firm hold. One last enemy counterattack was broken up by shell fire from American batteries to the northeast, raking the flank of the German assault column. In the center of the 4th Armored Division line, German infantry and assault guns drove in close to the CCB positions under cover of a smoke screen. But by mid-afternoon, the superiority of the American artillery be-

gan to tell, and the appearance of the dreaded "Jabo's" broke off the action.

When darkness came, the Germans again sent a shock force, this time supported by a few tanks, up the forward slope of Hill 318. This assault drove the Americans back over the crest and onto the reverse slope, where they were caught by a well-executed barrage laid down by German guns. Just before midnight, the 51st Armored Infantry Battalion regained the crest, after a preparatory shelling by four battalions of artillery had broken the German hold.

The enemy retaliated promptly. CCB was hit by heavy caliber artillery fire which continued for nearly an hour—causing 35 casualties in one company alone. Under cover of this fire, the 11th Panzer Division extended its hold on the dromedary-back, took Hill 293, and drove on to seize the high ground at the eastern edge of the Bois du Benamont. However, the infantry from the 51st, crouched in fox holes close to the crest of Hill 318, refused to give ground.

The German attack had made important gains during the night of 28-29 September, but the 4th Armored Division had added to its estimable record as an assault force and had proved equally tough and stubborn on the defensive. Here, as in previous engagements, XIX TAC had given yeoman support to the American troops fighting on the ground. General Weyland sent 107 fighter-bombers to aid the XII Corps during 28 September. One squadron, the 23d, made a strike at Bures which nearly levelled the village and cut up the German reserves assembling there—thus weakening still further the enemy ability to exploit a successful attack.

The morning of 29 September broke with a thick fog obscuring the battlefield. The exhausted German infantry tried to push on toward Arracourt but made no headway. Meanwhile, a platoon of medium tanks from the 8th Tank Battalion moved up Hill 318 in the fog, and when the haze finally

lifted the tank commander directed the American planes onto the German tanks which had assembled under the screening fog in the valley below. After several mishaps—which included the dropping of propaganda leaflets instead of bombs—the air-ground team began to close on the enemy.

By the middle of the afternoon, the Germans were streaming back through Foursasse Farm, and the rout was checked only when a few tanks were brought up to form a straggler line east of Parroy. Remnants of the 2d Battalion of the 110th Panzer Grenadier Regiment and a few tanks from the Reconnaissance Battalion, 11th Panzer Division held bravely to their positions in the Bois du Benamont, all the while under heavy fire from American TD's and cavalry assault guns. When night came, the survivors filtered south through the American lines.

The back of the Fifth Panzer Army attack was broken on 29 September, nor was there any further possibility of creating a new force for a continued effort to reach the Moselle River. During the afternoon, while the remnants of Manteuffel's armored task force were being hunted down around Bures by the fighter-bombers, General Balck made a personal visit to Rundstedt's headquarters at Bad Kreuznach. He told the OB West Commander that he still intended to wipe out the Pont-a-Mousson bridgehead and recover the Moselle defense line; but that he would need a "minimum" of 3 additional divisions, 40 or 50 tanks, 20 or 30 assault guns, 50 anti-tank guns with prime movers, 4 battalions of heavy artillery, and 4 battalions of engineers. Rundstedt had no troops to give Army Group G, for Hitler and Jodl had decided to throw the few reserves still available on the Western Front into an attack against the Second British Army, at this time driving forward to surround the Fifteenth Army between the Rhine and the Maas. Balck, therefore, had no choice but

to order the *Fifth Panzer Army* to go over to the defensive.

The Lorraine tank battles had ended, except for a last American tank sweep on 30 September, and this sector relapsed into quiet. The 4th Armored Division took up stabilized positions north and east of Arracourt, while the German infantry dug in a few hundred yards away. On 12 October, General Wood's division was relieved by the 26th Infantry Division and went into Corps reserve.

### Conclusions

On the whole, the September weather had been favorable to the superior speed and maneuverability of the American armor, with only a few days of mud to fasten the tanks to the high roads and with the sun burning through the morning haze in time for intervention by XIX TAC.

Through the earlier battles in Normandy and Brittany, the division had developed a high degree of coordination between the various arms—as now shown in the losses which TD's, artillery, and planes had inflicted on the enemy, and the tenacity and skill with which the armored infantry and the tanks had repelled the desperate German attacks in the last days of September.

Equally important, the division had learned much of the capabilities and limita-

tions of the M-4 tank and its short-barreled 75-mm gun, with which most of the medium tank companies were equipped. Maneuver had been the major tactic in Lorraine, with various types of the "mouse trap play" and surprise attacks from hull defilade—or under cover of the fogs rising from the Moselle and Seille bottoms—against German tanks whose high-velocity guns generally out-ranged the American tank weapon, but whose turrets (traversed by hand) turned so slowly that four or five rounds could be fired into a Panther before its own gun could be brought to bear. The American tank losses usually had been sustained in frontal attacks against enemy armor fighting from cover, or over level spaces where the superior range of the long-barreled 75-mm gun on the MK V could make the kill.

The operations of the 4th Armored Division had been highly successful—even if the division had never been free to make the dash to the Rhine which its personnel, officers and men alike, had wished. It had destroyed or damaged an estimated 285 German tanks or other armored vehicles since crossing the Moselle, at relatively small cost to the division. As a result, the 4th Armored Division would take the field in November as a veteran and successful division, with only a small admixture of untried replacements.

---

In the selection of an *objective* which is to be seized and physically held, only the airborne commander is afforded a wider choice than the armored commander. Even so, for the consolidation and exploitation of that objective, he is today dependent upon the arrival of his attached armor by land or sea, and will tomorrow await armor by air as well as land or sea.

As for maintaining or regaining the *offensive*, it was armor, almost without exception in World War II, which gave our commanders this capacity, and prevented costly repetition of the static combat of World War I. Armor is equally preeminent in the practice of the allied principles of *mass*, *movement*, *surprise*, and *simplicity*.

General Jacob L. Devers



# Integration of the Artilleries

Brigadier General Charles E. Hart, USA  
Assistant Commandant, AA and GM Branch, The Artillery School

SINCE the conclusion of World War II, there has been considerable discussion throughout the service on the subject of the integration of the Coast and Field Artilleries. From my own observations, I would say that the number of those for integration is about equal to those against.

An integrated artillery is not a completely new scheme of things. Prior to the spring of 1907, there was one Artillery Corps in the Army. However, variations in methods of employment, differences in missions, types of matériel, equipment, and organization dictated a separation at that time between the Coast and Field Artilleries. Although many of the basic concepts of war or their application have remained unchanged through the years, and in some instances for centuries, there have been some very radical changes in recent years. Among these changes are the rise of air power, the origin of antiaircraft artillery, armor, massed artillery fires, and developments in the fields of electronics, radiology, nuclear physics, and guided missiles capable of traveling tremendous distances at sonic and supersonic speeds. So it may be seen that some

conditions of war do change, and, needless to say, we must keep in step with them.

## Statement of Aims

However, some may ask, "Why is it necessary or desirable to have integration?" Nowhere have I seen a more concise statement of the aims of the integrated artillery program than the one enunciated in 1947 by General Jacob L. Devers, then Commanding General, Army Ground Forces, as follows:

"It has been brought to my attention that many officers of the Coast Artillery and the Field Artillery are not familiar with steps being taken to form a single artillery arm. I am taking this opportunity to outline the current situation relative to the integration of the two artillery branches.

"As early as a year ago, it became generally known throughout the Army that the War Department favored combining the Coast Artillery and the Field Artillery into a single arm. Plans for proposed legislation to effect integration were prepared by the War Department, but were not presented during the last session be-

***While the policy of integrating the artilleries is progressing, it will not be completely successful until all members of the Coast and Field Artilleries are bound together by an Act of Congress under one insignia***

cause other items had higher priority. It is anticipated that legislation to accomplish the integration of the Coast Artillery and the Field Artillery will be sought as early as it is practicable to do so.

"In the meantime, I have taken certain preliminary steps in anticipation of legislative approval of the integration of the

result, some harbor defenses were entirely eliminated, and obsolete weapons in others were declared surplus. Only certain types of modern fixed guns and submarine mines were recommended for retention. Units of the civilian components assigned to armament declared surplus were recommended for reassignment to mobile artil-



With integration, the Field and Coast Artilleries would be joined together in one artillery arm. Above, a 240-mm Howitzer, M1, the big field piece of World War II.

artilleries. These included the redesignation of the Field Artillery School at Fort Sill as The Artillery School, with an Anti-aircraft and Guided Missiles Branch at Fort Bliss, Texas, and a Seacoast Branch at Fort Scott, California. Instruction at The Artillery School in both the basic and advanced courses has been altered to include all types of artillery weapons. . . .

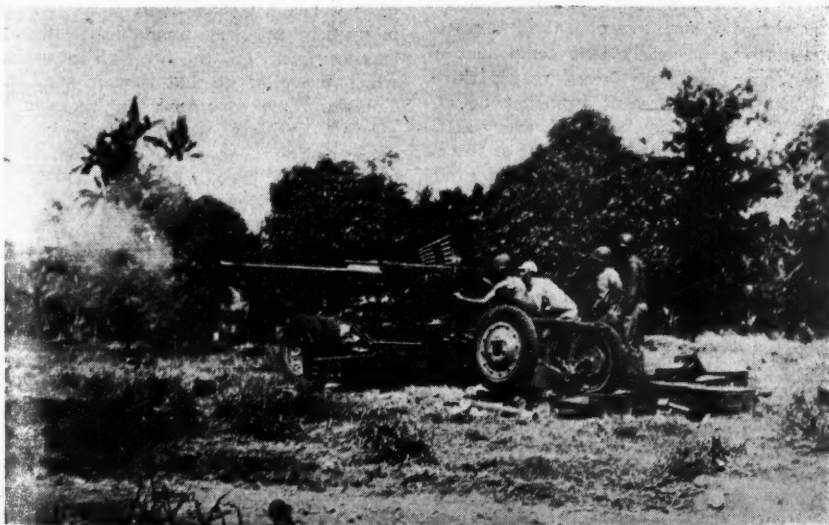
"During 1946, the War Department Seacoast Armament Board made a survey of harbor defenses and installations. As a

lery designed to fire at moving or fixed targets.

"Officers assigned to the Coast Artillery Corps or to the Field Artillery are considered first to be Ground Force officers, second artillery officers. Newly commissioned officers of the Regular Army assigned to either artillery branch receive the same basic course. They will serve in antiaircraft, field, or seacoast artillery units and will attend the same advanced course. It is considered impractical within



The antiaircraft weapon illustrates a point for those who favor integration of the artilleries into one artillery arm. Above, a 40-mm Automatic AA Gun, M1 (Bofors), employed in its antiaircraft role. Below, the same type gun being used in a ground-support role, the same as a field artillery weapon.—US Army photos.



the time available to them for officers of the civilian components to receive basic training in all artillery weapons. However, the associate advanced course is designed to give field officers a well-rounded knowledge of antiaircraft, field, and seacoast artillery employment. It will provide a valuable foundation for officers in command and staff positions requiring a knowledge of the employment and capabilities of the various artillery weapons.

"Regular officers who through age or length of service would not normally take the regular advanced course present a different problem. The associated advanced course is open for such officers, and they are urged to apply for it. In addition, consideration is being given to the establishment of short indoctrination courses which will give the Field Artillery officer a working knowledge of antiaircraft, seacoast artillery, and guided missiles, and the Coast Artillery officer a corresponding knowledge of field artillery.

"It is my intention that, first, the future artillery officer have a general knowledge of all artillery weapons and a specialized knowledge of some; second, the integrated artillery be a closely knit component of the Army Ground Forces team; third, neither of the present branches be absorbed by the other; and last, every artillery officer, regardless of present or future assignment, have an opportunity for advancement equal to that of any other artillery officer."

No profession known today offers such diversified activities, problems, and opportunities as does that of the military. It is interesting to a fascinating degree, and its problems will challenge the intelligence and ingenuity of the best minds of our country. In solving the multiplicity of problems incident to current military research, development, organization, tactics, and techniques, we must constantly endeavor to obtain the most practical solutions, those which will provide the

most efficient and effective results at the lowest cost in men and money.

The American way of life precludes a large peacetime military establishment. Consequently, the inevitable and only practical solution is a well-balanced, well-organized, well-trained, and efficient Army, Navy, and Air Force of reasonable size which will be capable of a rapid and effective expansion in the event of a national emergency. Discussing only the artillery aspect of this problem, I foresee in the early stages of an emergency, until air superiority has been attained by our forces, a sizeable requirement for antiaircraft artillery. Our capabilities in manpower, resources, and production, which are not unlimited, will have to be diverted to some degree, in order to provide the amounts and types of antiaircraft artillery initially required.

Under the proposed integration plan, one of the principal sources of trained personnel can and should be the Field Artillery. In the early days of the Tunisian Campaign, as Artillery Officer of II Corps, I wished many times to have more field artillery available. However, looking back on the over-all situation which prevailed at that time in southern Tunisia, I am convinced that more antiaircraft artillery would have been far more useful. The same condition, to a lesser degree, prevailed in Sicily. On the continent of Europe, this condition was practically reversed. The Allies had attained air superiority, and, consequently, a much less amount of antiaircraft artillery than was available could have accomplished the mission adequately.

### Flexibility Needed

One of the major contributing factors to the success of field artillery during World War II was its flexibility. Had we had an integrated artillery at that time, capable of quickly changing over from antiaircraft artillery to field artillery,

without encountering almost insurmountable retraining problems, consider what a saving in manpower there would have been. Had such been the case, we might not have had the critical shortages of infantrymen in practically every combat division during the last 6 months of the war in Europe. Such flexibility brought about through integration would have provided a sound, practical, and economical solution.

We did make some progress along these lines as World War II moved from North Africa to Sicily and thence to the continent of Europe. Anticipating that the Allied Air Forces and antiaircraft artillery would eventually drive the enemy from the skies, a number of antiaircraft artillery units available to First Army were given a limited amount of instruction in the ground-firing role. Field Artillery fire-direction equipment was provided and communication and technical procedures were evolved. As a result, many instances are recorded where and when antiaircraft artillery gun and automatic-weapon units effectively supported infantry and armor, reinforced the fires of conventional field artillery, or creditably performed other types of ground role missions.

Since World War II, as previously mentioned, the policy of integration was inaugurated on a service-wide scale by General Devers. In pursuance of this policy, a brigadier general with coast artillery background has been assigned as Assistant Commandant of The Artillery School at Fort Sill, Oklahoma. Likewise, one with field artillery background has been assigned as the Assistant Commandant of the Antiaircraft and Guided Missiles Branch of The Artillery School at Fort Bliss, Texas.

The staffs and faculties of both schools are composed of officers from both the Coast and Field Artilleries to the degree permitting the most effective instruction.

Similarly, the student officer members of the regular basic course and the regular advanced course are from both the Coast and Field Artilleries, and their respective courses of instruction are scheduled with phases in residence at Fort Sill and at Fort Bliss. The short-term associate courses, which are designed primarily for civilian-component officers, include a limited number of integrated subjects. However, owing to the comparatively short lengths of these courses, no attempt is made to transfer students back and forth between Fort Sill and Fort Bliss during their periods of residence.

After a period of almost 2 years of close observation of the application of integration at both Fort Bliss and Fort Sill, I can unequivocally say that, in my opinion, the plan is progressing favorably at these schools. It is felt, however, that it would be of even greater success if all members of both artilleries were authorized to wear the same insignia of branch. Congressional action will be required before this can be accomplished, however.

#### Seacoast Branch

Before it can be said that the subject of integration has received complete coverage, it is necessary to discuss briefly the one remaining branch of the artillery—the seacoast branch of the Coast Artillery. Here again, we should endeavor to be practical and squarely face the facts.

As far as I can determine, the fixed seacoast defense of the continental United States did not fire a single round in defense of our shores during World War II. All fixed seacoast defenses used by our enemies during the same conflict failed to stop a single Allied invasion. In practically every instance, these permanent defenses constructed by the enemy were either destroyed by preliminary air or naval bombardment or completely neutralized by naval gunfire or mobile attacking ground forces. I think most will

agree that fixed seacoast guns, certainly of the larger calibers, are outmoded relics of the past and consequently are of little value. Harbor defense submarine mines, together with the necessary fixed and mobile covering weapons, in reality have one mission, i.e., the protection of naval harbor anchorages.

Again, I believe most persons will agree that the over-all defense of our coastline should be based upon a mobile and not a static concept. So, it is fitting that we apply the lessons learned, soundly based upon World War II experience, and economize in men and money. In recapitulation, the protection of our naval harbor anchorages should be the function of the Navy, tied in, of course, with the over-all Army mobile ground defense. All that is necessary to be convinced as to the soundness of this statement is to look back to the early days of World War II and observe what actually occurred at the French Maginot Line, at the static French seacoast defenses along the Mediterranean coast of North Africa, and later at the ineffective fixed defenses constructed by the Germans along the so-called Atlantic wall.

It is provided, I believe, that the artillery staffs on division, corps, army, army group, and possibly theater levels, will be integrated. This concept is certainly sound. At some future date, when the arguments advanced by the Coast and Field Artillery opponents of the integration have been reconciled, when the Congress has seen fit to transfer the responsibility for harbor defenses to the Navy, and when the Anti-aircraft and Field Artilleries have been

combined into one flexible and effective artillery arm with adequate representation on Department of the Army level in the form of a Director with appropriate position and rank, we then will have a completely sound, practical, economical, and effective solution of this controversial problem. Such an arm will naturally include some who will specialize in anti-aircraft and others who will do the same in the field branch. This is as it should be—otherwise the artillery would be composed of “jacks of all trades and masters of none.” However, most certainly, all Regular Army members should be reasonably versed in both branches, so that the all-important attribute of flexibility can be obtained when dictated by the situation.

No mention has been made of the role of guided missiles in the life of the future artilleryman. This is due to the fact that our present concept in this regard is that, within the foreseeable future, guided missiles will merely provide the necessary extensions to our conventional anti-aircraft and field artillery weapons.

In conclusion, it is desired to reemphasize that the integration policy as enunciated by General Devers is progressing with reasonable success at both Fort Bliss and Fort Sill. However, it is felt that it will not be service-wide nor a complete success until all members of the Coast and Field Artilleries are bound together by Congressional decree, under one insignia of arm. It is earnestly hoped that those in and out of the service who in the past have opposed the integration of the artilleries will concede for the over-all betterment of our future national defense organization.



# UNIFIED COMMAND in THEATERS OF OPERATIONS

Lieutenant Colonel Edward M. Postlethwait, *Infantry*  
Former Instructor, Command and General Staff College

JM

UNIFIED command, as presently blue-printed for the theaters of operations, does not meet the urgent needs for modern war. In his only report on the National Military Establishment, Mr. James V. Forrestal stated: "There are still great areas in which the viewpoints of the services have not come together."

One of the touchiest and most vital of these areas is command of joint forces. Because of the potentialities for resounding explosions, the subject has been diplomatically soft-pedaled. When the mention of joint command structure becomes unavoidable, one of two things usually occurs. Either indefinite terms, which can be interpreted in a manner palatable to anyone, are used, or the viewpoint of only one service is expounded, depending upon who is listening. None of this has the flat approval of the Joint Chiefs of Staff!

If we are to prosecute our next war successfully, firm doctrine based on common sense must be arrived at, agreed upon, and taught in our service schools now!

The Armed Forces Staff College presently carries the principal responsibility for the establishment of doctrine on theater command. However, little or no authority goes with it. The unilateral services accept Armed Forces Staff College

doctrine to varying degrees, each using its own service doctrine to replace those items it considers not acceptable.

Present joint doctrine, as taught by the Armed Forces Staff College and approved by the Joint Chiefs of Staff for instructional purposes only, includes the following basic tenets:

1. That the theater commander will direct operations through the commanders of the three armed service components in the theater (i.e., the Theater Army, Navy, and Air Force Commanders) and the commanders of any theater joint task forces established by the theater commander (see Figure 1).

2. That theater logistics will be operated principally on a unilateral basis including such items as:

- a. Each armed service component in the theater will have its own logistical agencies under its respective commander.

- b. Theater special staff operating agencies will control critical classes of supply and common services on a theater-wide basis (i.e., transportation, including allocation of shipping; petroleum; medical services; construction).

- c. Theater joint base commands will be established, when desirable, to coordinate the activities of the unilateral

**Theater commanders theoretically have freedom to establish units of command, but this freedom is presently restricted by the doctrine on theater command, tactical air forces, strategic forces, and logistics**

installations therein, and to assume responsibility for construction and control of common facilities and for their local defense (land, sea, and air).

d. Theater joint area commands will be established, when desirable, to coordinate logistical agencies over a large area in a manner similar to a joint base command. This applies particularly to groups of islands in an oceanic theater.

e. Procurement and distribution to all armed forces in the theater of certain supplies will be the responsibility of one of the unilateral commands.

f. All theater logistics is coordinated and controlled by the theater commander, J-4, having staff responsibility.

3. That certain forces of a strategic nature (long-range bombers, submarines, the US fleet) will operate directly under the Joint Chiefs of Staff, although they usually are based and operate within the boundaries of a theater of operations (see Figure 1).

### Broad Concept of Operations

Having established the basic facts relative to the present status of doctrine regarding unified command, let us consider the essential jobs to be done and the relation to each other of the various fighting forces available to the theater commander.

There are three general mediums in which combat operations are conducted: the land, the sea, and the air. Each of the armed services of the Military Establishment is organized, trained, and equipped to fight for control of one of these three mediums. It is nearly impossible in modern war to conduct a battle using exclusively units of only one of the three armed services. In the most usual situation, a battle will be fought for a decision in one of the three mediums of combat. The major forces involved will be those of the armed service concerned, but those forces will nearly always have to be supported or

assisted by units of at least one of the other two services.

In future warfare, it is generally conceded that the first major battle will be in the air, or perhaps simultaneous with the sea battle. During the air, and/or sea battle, all three of the armed services will be involved, but with the Air Force or the Navy furnishing the major combat units and the command of operations. The Army will initially be in a supporting role, such as the seizure of bases or local defense, and as such should expect to find its units frequently assigned to joint forces commanded by Navy or Air Force officers. The Navy and the Air Force should each, likewise, expect to find some of their units in supporting roles and under command of the other. As the land battle develops and the air and sea battles subside to a condition of maintaining superiority, then it should be expected that the Army will take the lead in numbers of combat units engaged and in furnishing high command, while the roles of the Navy and Air Force become that of supporting the land battle. It should be expected, also, that manpower allotments and the industrial effort of the nation will shift from the production of equipment for one service to that of another as the main battles of the war shift from one medium to another.

### Command Requirements

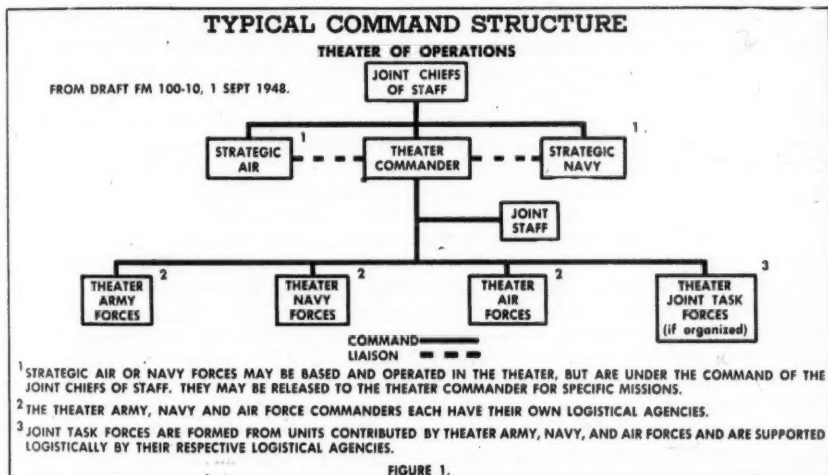
Under the broad concept of operations discussed, the theater commander must first plan his campaign based on his directive from the Joint Chiefs of Staff. As a part of his operational planning for each task of his campaign, he must determine what combination of forces is best suited to accomplish the task, and also the best command structure and organization of the forces involved for the conduct of the operation. In order to make these decisions, he must have maximum freedom of action in his authority, and he must have flexibility in applying the doctrines

of organizational command of the forces available to him.

Current instructional material indicates that the theater commander may conduct his campaign through unilateral commands whose efforts are coordinated at the theater level. Or he may, at least in theory, go to the opposite extreme and organize all combat units into Joint Task Forces, leaving no forces under operational control of the theater unilateral commanders (see Figure 1). In practice, he will prob-

### Unified Command—Present Doctrine

The National Security Act of 1947 states, in Section 2, "Declaration of Policy," that "It is the intent of Congress to provide . . . for their (the Armed Forces) authoritative coordination and unified direction . . . but not to merge them . . . and for their integration into an efficient team of land, naval, and air forces." In other words, the forces of the three armed services will be "coordinated" and "integrated," but not "merged."



ably need an organization for combat somewhere between the two extremes.

### Present Limitations

There are four principal factors in present doctrine which limit the theater commander's operations in efficiency, flexibility, and freedom of action necessary to meet the varying situations as his campaign progresses. These four factors are: the presently prescribed unified organization for combat, doctrine of the individual armed services, doctrine of command of strategic forces, and doctrine of logistical control in the theater.

Under present doctrine, the theater commander can integrate forces into joint task forces in order to carry out coordinated action. The issue is avoided, however, as to how far down the command line this integration should go. It is conceivable that, at some point, integration becomes merging, which is forbidden by law. To remain on safe ground on that point, present joint doctrine provides that an officer of one service will not command combat units of any other service, except in the role of a joint commander, and then only through the commanders of the armed service components of the joint

force. This command structure not only effectively prevents merging of forces, but it also restricts flexibility and efficient control of the force as a whole by virtue of the fact that the system requires three separately commanded components to be set up and a joint staff to be assembled and trained each time a joint force is formed.

The only type of unified command advocated as an alternate to the "joint" system, and which is contemplated only for lower echelons within a large joint force, is known as the "temporary command" arrangement. Temporary command is used where components of two services must work together for a short period. In order to have unified command rather than cooperative unilateral command, one component is placed temporarily under the command of the commander of the other service component. This system, however, works well only when one service component has definite primary interest in the action at the time during which the temporary command arrangement exists. A simple, but excellent, example of this type of unified command is found in the case of an Army infantry battalion aboard a Navy combat transport. Everyone aboard is under the command of the ship's captain, who commands the Army troops through the Army battalion commander.

An example of where neither joint command nor temporary command is used is found in the case of a field army being supported by a tactical air force. Here the action is completely cooperative and is coordinated through the air-ground operations system. In the case of a disagreement between the field army commander and the tactical air force commander, there is no common command with authority to make a decision on the controversy below the theater commander.

#### Army Doctrine

Army doctrine on the employment of its

type units does not restrict a theater commander in any way. He may organize Army units into unified commands of any size without conflicting with Army doctrine. He may attach Army units to commands of either of the other two services at any time, also without conflict with Army doctrine. This, unfortunately, is only partly true with respect to Navy doctrine and under no conditions true with respect to Air Force doctrine.

#### Navy Doctrine

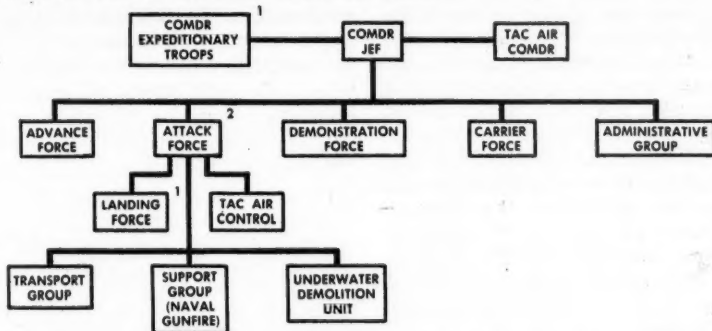
Navy doctrine on the employment of its type units (i.e., combat ships and shipping) requires that they always be under Navy command. This doctrine is based on the fact that considerable specialized knowledge and experience in the employment of naval forces is required in order to employ naval forces promptly, and that such experience lies only in the Navy. In practice, this doctrine has a certain amount of flexibility in its application in line with requirements for unified command. This flexibility, however, is not indicated, except by implication, in Department of the Navy manuals. For example, "Amphibious Instructions for Naval Forces," USF-6, states flatly that the Joint Expeditionary Force commander will be a naval officer. This is in accordance with the doctrine just discussed. It says, further, that the Joint Expeditionary Troops commander assumes command ashore when the troops are firmly established (see Figure 2). It does not state that command of naval forces remaining in the area will normally pass to the Joint Expeditionary Troops' commander, although such was usually the case in World War II.

#### Air Force Doctrine

Air Force doctrine on the employment of its type units has already been mentioned. The idea that a weapon having theater-wide range should be retained under theater command is basically sound. Here

## THEATER JOINT TASK FORCE ORGANIZATIONS

### 1. TYPICAL JOINT EXPEDITIONARY FORCE (Navy USF-6)



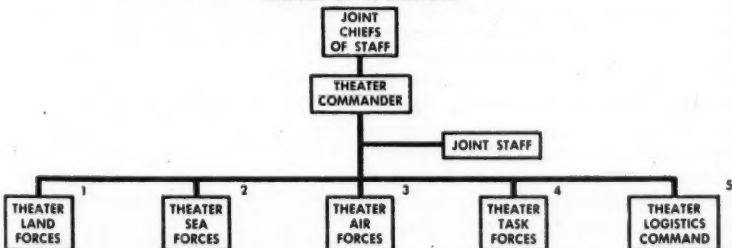
<sup>1</sup> COMMANDERS OF EACH LANDING FORCE ASSUME RESPONSIBILITY FOR THE ACCOMPLISHMENT OF TASKS WHEN ESTABLISHED ASHORE AND UPON NOTIFICATION TO THE COMMANDER OF THE CORRESPONDING ATTACK FORCE THAT HE IS PREPARED TO ASSUME THE RESPONSIBILITY. THE COMMANDER, EXPEDITIONARY TROOPS, TAKES OVER SIMILARLY FROM THE COMMANDER, JOINT EXPEDITIONARY FORCE.

<sup>2</sup> THERE MAY BE SEVERAL ATTACK FORCES DEPENDING UPON THE TASKS TO BE ACCOMPLISHED.

FIGURE 2.

## PROPOSED COMMAND STRUCTURE

### THEATER OF OPERATIONS



<sup>1</sup> THE THEATER LAND FORCES ARE SO DESIGNATED BECAUSE THEIR MISSION WILL BE TO ACHIEVE THE NECESSARY DECISION ON LAND. THE MILITARY FORCES INVOLVED WILL BE MAINLY ARMY ELEMENTS. AIR AND NAVY ELEMENTS, HOWEVER, WILL BE ALLOCATED TO LAND FORCES BY THE THEATER COMMANDER AS REQUIRED FOR DIRECT SUPPORT IN GAINING THE DECISION ON LAND.

<sup>2</sup> THE THEATER SEA FORCES ARE SO DESIGNATED BECAUSE THEIR MISSION WILL BE TO ACHIEVE THE NECESSARY DECISION ON THE OCEAN. THEATER SEA FORCES WILL BE MAINLY NAVY ELEMENTS. ARMY AND AIR FORCE ELEMENTS WILL BE ALLOCATED TO SEA FORCES BY THE THEATER COMMANDER AS REQUIRED FOR DIRECT SUPPORT IN GAINING THE DECISION ON THE SEA.

<sup>3</sup> THE THEATER AIR FORCES ARE SO DESIGNATED BECAUSE THEIR MISSION WILL BE TO ACHIEVE THE NECESSARY DECISION IN THE AIR AND TO EXECUTE LONG-RANGE BOMBING NOT DIRECTLY A PART OF LAND OPERATIONS. THEATER AIR FORCES WILL BE MAINLY AIR FORCE ELEMENTS. ARMY AND NAVY ELEMENTS WILL BE ALLOCATED TO AIR FORCES BY THE THEATER COMMANDER AS REQUIRED FOR DIRECT SUPPORT IN ACHIEVING AIR FORCES MISSIONS.

<sup>4</sup> THEATER TASK FORCES WILL BE ORGANIZED, AS NEEDED, ON A TEMPORARY OR PERMANENT BASIS TO ACHIEVE SPECIFIC MISSIONS IN WHICH THE DECISIONS WILL BE GAINED IN MORE THAN ONE ELEMENT BUT AS PART OF A SINGLE OPERATION. THESE MISSIONS MAY REQUIRE A SHIFT OF COMMAND DURING THE OPERATION CONCERNED. SUCH TASK FORCES WILL BE REQUIRED PRINCIPALLY FOR AMPHIBIOUS AND AIRBORNE OPERATIONS.

<sup>5</sup> THE THEATER JOINT LOGISTICS COMMAND SUPPORTS ALL COMBAT FORCES WITHIN THE THEATER IN ACCORDANCE WITH LOGISTICS PLANS APPROVED BY THE THEATER COMMANDER.

FIGURE 3.

again, however, there is a lack of flexibility in the application of the doctrine.

During any period of a theater campaign in which the air battle for air superiority is being conducted, or during which the major effort of theater air units is employed on theater-wide target systems, the Air Force doctrine of centralized command is in line with the needs of the theater commander because he is conducting an air battle. Once air superiority has been gained and the major strategic target systems have been neutralized, then the bulk of the theater air effort is no longer required to maintain the conditions established. The principal mission of tactical air is then to assist and support directly the land battle.

Closely coordinated air participation in the land battle requires careful integration of the plans and orders of Army and Air Force units. This necessity is exemplified in the methods employed in the air-ground system described in Field Manual 31-35, in which a tactical air force and a field army are "associated" in conducting the battle. It is in this situation that the theater commander needs a certain amount of doctrinal flexibility in the use of his theater tactical air. Depending upon the air and land situations, he may well desire to commit some portion of his tactical air to the single mission of supporting his main land effort. This may involve attaching tactical air units to a field army or an army group or placing tactical air under a joint command with Army units. Air Force doctrine, however, does not contemplate that tactical air and Army commands will ever operate under unified command, either as a joint task force or by placing command of one under the commander of the other.

Air Force doctrine holds that a unified command at that level would restrict theater-wide concentration of tactical air effort. This is partly true in that concentration might take longer. However, once

the demand for theater-wide tactical air effort has diminished, the need for unified command still cannot be satisfied within Air Force doctrine because it allows for no exceptions. This inflexibility of doctrine limits the theater commander in providing for unity of command in creating joint forces. He must accept the idea of integrating the efforts of two units on a cooperative or "associated" basis, regardless of the situation.

### "Strategic" Forces

Presently accepted doctrine on the use of "strategic" forces (long-range bombers, submarines, the US Fleet) is a further limitation on the freedom of action of the theater commander (see Figure 1). The Joint Staff at the national level is not organized as an operational command post prepared to conduct day to day operations, which means that the detailed assignment of missions and objectives for "strategic" forces must be done by the department of the armed service concerned. At the same time, most of the strategic forces will operate or be based, or both, within the boundaries of a theater.

In other words, the theater commander will not necessarily command *all* forces in his theater. Since he is responsible for conducting the war in his theater, he is entitled to complete command of all the forces therein in order to coordinate properly all operations. Such an arrangement would not limit the ability of the Joint Chiefs of Staff to prescribe missions and objectives for strategic forces nor to move them from theater to theater. All Joint Chiefs of Staff operational directives, however, would then flow along a unified command line to the theater commander, who *does* maintain a command post for conducting day to day operations and who could then coordinate *all* combat action in his theater.

### Logistics

With respect to logistical control, it is



obvious that if a theater commander is expected to conduct a closely coordinated campaign with integrated forces he must have close control of logistical support. His logistical system must be flexible in order that the weight of the support can be shifted from one critical area to another in a minimum of time.

Present doctrine on theater control of logistics provides the mechanism for control but not the command responsibility that is needed by the theater commander. For example, if the commander desires to have very close control, he can obtain it by creating theater special staff operating agencies to control all supplies and services used by two or more armed force components, by establishing all bases as joint base commands, by including all territory not in the battle area in joint area commands, and by issuing detailed logistical instructions to all joint and unilateral agencies. Administration of such close control requires, however, tremendous effort by the theater J-4 and special staff, and strong backing by the theater commander. Proper inspection and supervision to insure compliance with detailed instructions would require a disproportionate amount of the theater commander's time at the expense of attention to combat operations.

The Munitions Board is engaged in a program of standardizing the nomenclature and cataloging of common items of the three services for purposes of coordinated procurement. The Board's report indicates that over 75 percent in dollar value of all munitions will be eventually common items of procurement. Standardization of supply items by the Munitions Board will be of great assistance if these items are received, stored, and initially distributed by a theater joint logistical command. Such a command should also operate all common services in the theater such as transportation, medical service, and rest areas. Unilateral agencies would then process

only items and services peculiar to themselves and still within the framework of the unified logistical command.

Present Army doctrine in Field Manual 100-10 indicates that the theater Army logistics officer will command the Army Communication Zone under the theater Army commander, and that the Army Communication Zone is an area as well as a functional command. In other words, a theater area command, which will unquestionably have Navy and Air Force installations within its boundaries, is placed under the theater Army commander who is on a co-equal basis with the theater Navy and Air Force commanders. This puts the theater Army commander, as well as his Army Communication Zone commander, in an untenable position so far as his ability to coordinate such items as local defense (land, sea, and air) and the allocation of real estate among the agencies not under his command.

A modification of doctrine on theater command structure to include the designation of a theater joint logistics commander who commands directly all logistical agencies in the theater, both joint and unilateral, would be a definite improvement. Neither the Joint Chiefs of Staff principles of joint command nor the National Security Act prevents the formation of such a command. This organization would make one man directly responsible to the theater commander for logistics, unify logistical control, relieve the theater commander of administering the details of the system, and allow the theater J-4 to confine his work to planning and policy matters rather than to operating.

The theater commander would gain in efficiency in three principal ways. First, logistical flexibility. The theater commander could economize on the over-all theater supply requirements by "starving" units not engaged in combat or engaged on minor efforts while allocating his supplies to units engaged in the theater main

effort. This practice cannot be followed effectively until every possible item has been standardized and is distributed under theater control. Second, the coordination of the use of real estate, coordination of local defense, allocation of transportation, and administration of training areas and rest areas would be the responsibility of a single agency under the theater commander. Third, a gain in morale. With three unilateral supply systems in the theater distributing similar items, there will always occur jealousies and loss of morale where one service has more of and a better type of similar items.

In the Pacific area, for example, on many occasions Navy construction battalions, housed in quonset huts with plywood floors and eating fresh beef several times a week, were living and working alongside Army engineer units housed in floorless pyramidal tents and eating dehydrated rations. With all three services literally being fed from the same bread-basket under joint control, no such problems need arise.

### Summary

In summary, it may be said that, under the statements of principles and doctrine of joint command, the theater commander has theoretical freedom to establish complete unity of command in the organization and direction of the forces in his theater. However, his freedom of action is restricted by present doctrine on theater command structure, employment of tactical

air units, command structure for the direction of strategic forces, and the organization of theater logistical forces. If the theater were organized as shown in Figure 3, in which the three major subordinate operational commands are broader in scope than a mere division by service and include all elements directly concerned with the gaining of the land, sea, or air decision regardless of service, then every unit in the theater would have a clear cut command line to the commander responsible for the conduct of the battle in which that unit is engaged. This cannot be brought about until: (1) Air Force doctrine on the employment of tactical air units becomes more flexible, (2) so-called "strategic" forces are placed under theater command, and (3) there is a single theater logistics command.

With those revisions to present joint doctrine, the theater commander could then shift the assignment of his forces at will, control and coordinate all operations in his theater, and have flexible and easy control over theater logistical support. Most important of all, he would have a definite command line from himself through the commanders charged with conducting his land, sea, and air battles down to the lowest echelons of command. "Association," "cooperation" and "coordination" are fine words describing necessary attributes to a successful military body, but history has proved again and again that they are not substitutes for command authority.

---

To those who contend that each service must be the sole arbiter of its own needs, I would reply that this nation can no longer tolerate the autonomous conduct of any single service. The unaudited conduct of its affairs by any single service is an open invitation to spendthrift defense. And the waste of our resources in spendthrift defense is an invitation to disaster.

*Secretary of Defense Louis Johnson*

# The Logistical Planning of Operation Overlord

Lieutenant Colonel Frank A. Osmanski, *General Staff Corps*

*This is the first of three articles by Lieutenant Colonel Osmanski on the logistical planning of Operation Overlord. The second and third articles will appear in the December and January issues of the MILITARY REVIEW, respectively.—The Editor.*

## PART I

**T**HIS study analyzes certain representative aspects of logistical planning in the European Theater of Operations for the 1944-1945 Allied campaigns against the Germans in Northwest Europe, with the object of illuminating the role of strategic logistical planning at theater levels.

The study reviews briefly the history of the staff organizations and methods of coordination utilized in logistical planning for *Overlord* and post-*Overlord* operations. It summarizes the logistical problems met and the logistical plans, policies, and procedures developed by those staffs. Also, it evaluates the effects of these developments on actual operations. The study deduces the improvements that might be made and the errors that must be avoided in the course of similar planning in the future, and it derives from this analysis the purpose, the province, and the validity of strategic logistical planning.

Essentially, the answers to the following basic questions are developed:

What is strategic logistical planning?

How might a theater of operations organize to conduct strategic logistical planning?

What functions will strategic logistical planning perform?

What results are produced by strategic logistical planning?

How should a strategic logistical planning section at the level of a theater of operations be organized?

## Strategic Logistical Planning

Strategic logistical planning is defined as the art of long-range (from the standpoint of time), long-distance (from the standpoint of geographical location) planning for the concentration, movement, and supply, by land, sea, and air lines of communication, of troops, their transport, their equipment, and their supplies, on a large scale.

Strategic logistical planning is a complement to strategic operational planning throughout the levels of the Combined Chiefs of Staff, the Joint Chiefs of Staff, the Department of the Army, combined headquarters such as AFHQ and SHAEF, and the headquarters of theaters of opera-

**Broad strategic logistical plans had to be made before the Allies could launch their attack in Europe. This article tells how the planning was organized and draws certain lessons from experience**

tions. The logistical planning performed in lower echelons of command, where tactical planning is done, is other than strategic (see Chart 1).

The purpose of strategic logistical planning is to formulate and provide a coordinated, long-range basis for use by the military agencies concerned with procurement, project planning, and the provision of service troops. Strategic logistical planning, therefore, is of vital primary concern to the following staff sections: G-3 (including Plans) or Plans (formerly G-5); G-4 (Plans); and the Technical Services. With particular focus on these staff sections, which are primarily concerned with strategic logistical planning, let us now examine how the European Theater of Operations evolved its organization for such planning and how it located, related, and coordinated these staff sections in the process of logistical planning for Operation Overlord.

#### Early Organization

Planning for cross-Channel operations into Europe was born of a resolution on the part of the British immediately following Dunkirk to return to the continent of Europe at the earliest opportunity. Some long-range logistical planning for this operation was accomplished as early as 12 June 1941, of course clandestinely, when contracts were granted by the British to a United States contractor for construction of air and naval bases in Northern Ireland and Scotland. Ostensibly, these bases were intended for the British, but actually they were primarily meant for the US forces which, it was anticipated, would arrive following a formal declaration of war.

The European Theater of Operations (ETO) evolved in part from a pre-war origin in the Lend-Lease Act which was passed by the 77th Congress on 11 March 1941. ETO had its real beginning in a decision by the President of the United

States and the Prime Minister of England, upon the advice of the newly-created Combined Chiefs of Staff, made in Washington in December 1941, that for essentially logistical reasons our combined resources would be concentrated first to defeat Germany, the greater and closer enemy, and then Japan.

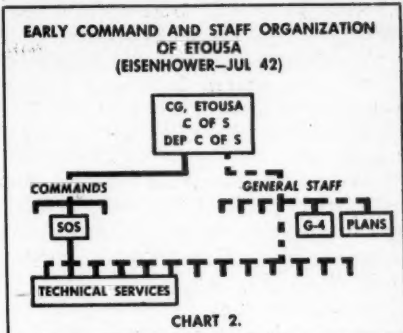
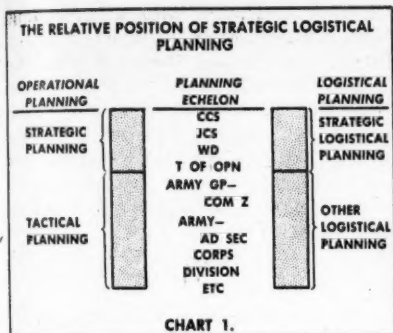
At this early meeting in Washington, which was known as the ABC-1 Conference, it was agreed that the necessary forces for a major offensive against Germany should be built up in the United Kingdom without delay. This was the beginning of a plan, later known as *Boleto*, which was to provide for the operations in Northwest Europe that part of logistical planning which deals with the concentration of troops and equipment.

A few months later, in April 1942, when General Marshall and Mr. Harry Hopkins visited the British Prime Minister, the British War Cabinet, and the British Chiefs of Staff in London, ETO received additional impetus when it was further agreed that the final blow against the Axis in Europe must be delivered across the English Channel and eastward through the plains of western Europe.

Formal organization of the European Theater commenced with the establishment of the Special Observers Group in London on 19 May 1941. Its purpose was to go ahead quietly with arrangements for handling the great concentration of American men and matériel that, once war was declared, must eventually be built up there. After Pearl Harbor, the Special Observers Group was renamed the US Army Forces in the British Isles (USAFBI) and a Headquarters US Army, Northern Ireland Force, was activated in January 1942.

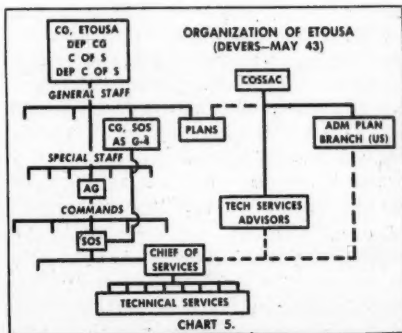
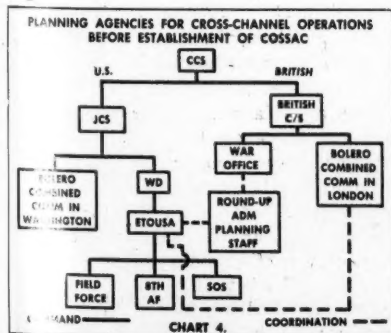
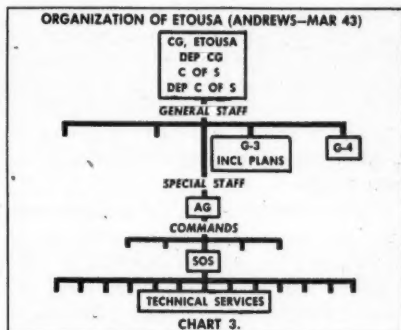
Major General Chaney, the Commanding General of USAFBI, on 1 May 1942 cabled the War Department his plans for setting up a Services of Supply (SOS) to carry on the planning and execution of Operation

Jan Feb 1941



*Bolero*, the purpose of which was to concentrate American troops and equipment in the British Isles preparatory to a cross-Channel invasion. The War Department replied that it had already considered such an idea and was activating the Headquarters SOS USAFBI under Major General John C. H. Lee on 24 May 1942. Meanwhile, on 8 May 1942, ETOUSA had been activated, and soon thereafter Major General Eisenhower was ordered to assume command of it on 24 June 1942.

General Eisenhower's early organization of ETOUSA (see Chart 2) was established by his General Order 19. To the original mission of SOS, the planning and execution



of *Bolero*, the General Order added a new mission, to plan the administrative and supply aspects of operations to be undertaken in that theater. In General Eisenhower's organization of ETOUSA, the G-4 (Plans) and the Plans (G-5) sections were closely related, and the ETOUSA G-4 had easy and direct access to the theater Technical Services. The latter, though they had already come under the strong influence of the CG SOS, were nonetheless not under his command.

A few months later, Operation *Torch* in North Africa was staged. This operation required the withdrawal of many of the supplies, troops, and staff officers previously established in ETOUSA. This withdrawal of personnel, many of them from key positions, considerably weakened the ETOUSA staff, required a reshuffle of available personnel that tended to interrupt planning, and was the first of a series of reorganizations and shifts of personnel in that staff which tended to weaken its organization.

When General Eisenhower assumed command of the North African Theater of Operations, Lieutenant General F. M. Andrews, Air Corps, was announced as Theater Commander, ETOUSA, effective 3 February 1943. Before General Andrews could completely orient himself in his new theater, General Lee of SOS proposed that the CG SOS be made Deputy Theater Commander for Supply and Administration and that G-4 of the theater be placed under him. His first proposal of this had been in February 1943, which marked the beginning of a long conflict between the CG SOS and the G-4 ETOUSA that was not to be resolved until General Eisenhower returned to assume the role as Supreme Commander Allied Expeditionary Force.

General Andrews soon reorganized the theater along new lines (see Chart 3). He did not make the CG SOS the Deputy Theater Commander, but nevertheless the effect of his reorganization was that there

was wide separation with a compelling commander between the theater G-4, whose primary mission was logistical planning for cross-Channel invasion, and the Chiefs of the Technical Services, who were by now steeped in planning and executing *Bolero* under the CG SOS. In fact, ETOUSA G-4 could contact the Theater Services only by writing formally through the Theater Adjutant General.

During these periods—the early Eisenhower and subsequent Andrews periods—strategic planning was concentrated on an invasion of Northwest Europe scheduled for the spring of 1943, to which the code name *Roundup* had been assigned. *Roundup* planning committees began meeting first in April 1942 to consider all combined aspects of cross-Channel operation under a specific plan of invasion. However, the troop basis subsequently changed so frequently, and the target date was repeatedly pushed so much farther into the future, that *Roundup* planning, in order to continue at all, had soon to be divorced from any specific plan of invasion. It thus became administrative in nature, considering such problems as the smoke-screening of beaches, the assessment of beach and port capacities, arrangements for mounting a typical invasion from the United Kingdom, and the development in general of US and British lines of communication.

This planning was nonetheless important because the *Roundup* Administrative Planning Committees, of which there were some 40 in action over a period of more than a year, developed some of the basic logistical policies and planning factors which were later to influence the Chief of Staff, Supreme Allied Commander, (COSSAC) and Supreme Headquarters, Allied Expeditionary Force (SHAEF) planners. Coordination of planning at this time (see Chart 4) was effected through the requirement that all the various viewpoints were represented and reconciled in meetings which consequently proved to be numerous,





The objective of Operation *Overlord*, and the logistical planning which preceded it, was "to secure a lodgement on the Continent from which further offensive operations could be developed." Above, a Normandy beachhead on 12 June 1944; below, supplies being unloaded at a beachhead 3 weeks after D-day.—US Army photos.



slow, tedious, and not very productive. Despite these difficulties, a *Roundup* Administrative Planning (RAP) pamphlet was to become COSSAC's first logistical bible.

When General Andrews was killed in a plane crash in Iceland, he was succeeded on 8 May 1943 by Lieutenant General Jacob L. Devers, whose reorganization of the theater was revolutionary (see Chart 5). It was rumored in London on his arrival that prior to his coming to England General Devers had been persuaded by General Somervell to accede at least in part to the earlier recommendation by General Lee that the CG SOS be made Deputy Theater Commander for Supply and Administration and that the theater G-4 be placed under him. General Devers did not go quite that far, but he did make the CG SOS the theater G-4, which would have seemed to effect a closer tie between the theater strategic logistical planners and the Technical Services, but which actually served only to put greater emphasis on planning the buildup (*Bolero*) in the theater than on planning for logistical operations on the Continent. Moreover, by this time, COSSAC, the predecessor to SHAEF, was deeply engaged in planning the impending invasion so that strategic logistical planning by this time focussed on that new agency. All agencies interested in strategic logistical planning would seem, therefore, to have been tied together. As a matter of fact, the actual situation was quite different. The difficulty was somewhat as follows.

#### COSSAC and *Overlord*

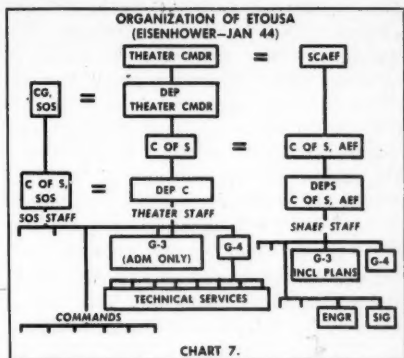
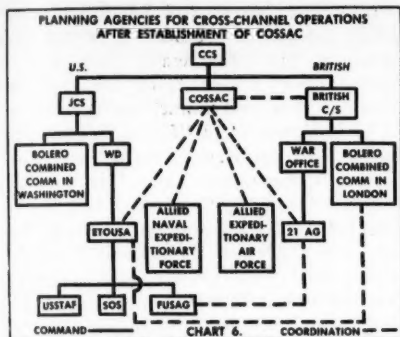
By directive of the Combined Chiefs of Staff following the Casablanca Conference in January 1943, Lieutenant General Fred E. Morgan (British) had been designated to act as the "Chief of Staff to the Supreme Allied Commander," pending the eventual appointment of that commander. He was directed to organize a planning staff (soon

to become known as COSSAC, the initials of General Morgan's title) for the purpose of planning, among other operations, a cross-Channel invasion with a target date of 1 May 1944. This was Operation *Overlord*, the object of which was "to secure a lodgement on the Continent from which further offensive operations could be developed."

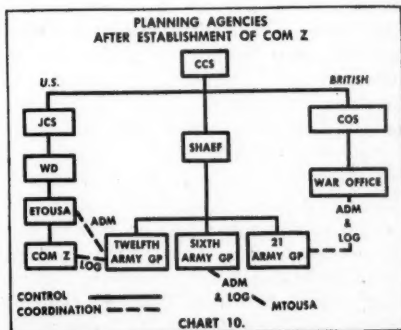
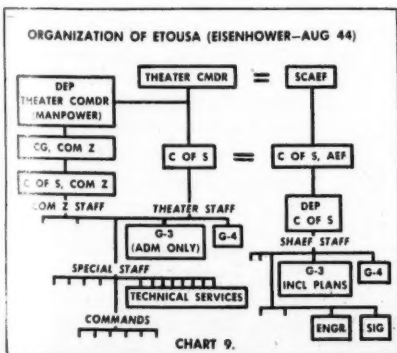
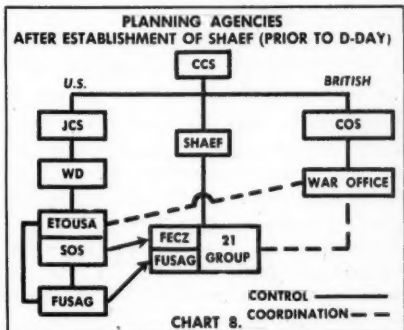
Since the *Roundup* planning committees had done essentially administrative planning, the COSSAC planning staff was intended to perform essentially operational planning. However, in order that the overall strategic plan might be developed in consonance with logistic feasibility, and in order that the COSSAC planners might be assured that there would be at least one practical way of supporting logistically the operation they were planning, the COSSAC logistical planners became very active in developing logistical planning factors, in conducting elaborate logistical studies of the lines of communication, and in making both outline and detailed logistical tests of the strategy developed at COSSAC.

United States G-4 planners for COSSAC were drawn originally from the G-4 section of ETOUSA; they were subsequently attached to the Office of the Chief of Services (actually the G-4) SOS when General Lee became G-4, ETOUSA, and finally they were assigned to COSSAC outright once it attained executive authority. COSSAC had, of necessity, certain advisors drawn from the technical services who were in fact the representatives at Norfolk House, where COSSAC was at work, of the Theater Technical Service Chiefs (SOS). The Administrative Planners of COSSAC, as the strategic logistical planners for *Overlord* were then called, frequently required policy decision on service matters in order to proceed with their logistical planning.

Busy with *Bolero* and ostensibly not evaluating that COSSAC would some day



become SHAEF and that the COSSAC Plan would be the ultimate pattern for invasion, SOS decided that its Technical Services representatives at COSSAC might render such decisions as they saw fit. Soon, however, there were repercussions when preliminary COSSAC plans based on such decisions proved to be unacceptable to SOS, whose concurrence in them was therefore withheld. Accordingly, SOS amended its original decision and decreed that its service representatives with COSSAC might render no decisions but would act in a liaison capacity only, referring questions of policy asked by the Administrative



Planning Branch, COSSAC, to the Chief of Services, SOS, for formal decision. Engrossed in other concerns, the Chief of Services, SOS, frequently overlooked replying to these questions from COSSAC with the consequence that further misunderstandings ensued. SOS finally decided that the US service advisors of COSSAC should neither make nor obtain decisions in policy matters but might be used only for advice in technical, non-policy questions.

It was on this basis that COSSAC planning proceeded for a long time. Eventually, however, for this and other reasons, General Morgan insisted that the Combined Chiefs of Staff grant COSSAC executive as well as planning and coordinating authority. Accordingly, by CCS directive in September 1943, COSSAC became an executive staff which was in fact the nucleus of the imminent Supreme Headquarters.

It is important to note of this period (see Chart 6) that COSSAC was a planning and coordinating agency only and had no commander available to make or demand the decisions necessary for planning the operation he must eventually execute. Even so, relationships between the logistical planners at COSSAC and the theater Technical Services under SOS might have been effective had it not been, for the interposing Office of the Chief of Services (really G-4, SOS) with which there was from the start a lack of mutual understanding. Furthermore, it should be noted that the method used to coordinate logistical planning during this period was to attempt to obtain universal concurrence to all plans and policy, a truly cumbersome method, especially as SOS more frequently demurred than concurred.

The CG SOS continued, thus, as theater G-4 until General Eisenhower returned to London in December 1943 to become Supreme Commander Allied Expeditionary Force, excepting for a significant though brief interlude when Major General Robert W. Crawford, the prospective

SHAEF G-4, became G-4 ETOUSA, completely independent of SOS. However, his tenure of this office lasted only a few months prior to his being assigned to COSSAC as a preliminary assignment to SHAEF. Meanwhile, COSSAC, in anticipation of General Eisenhower's coming as Supreme Commander, changed its name by proper authority to Supreme Allied Headquarters (SAH) and spoke of its forthcoming commander as the Supreme Allied Commander (SAC), titles which General Eisenhower was himself to supersede with SHAEF and SCAEF.

The Plans Section of Headquarters ETOUSA had by this time been dissolved and Major General Barker, its former Chief, was now assigned to COSSAC on a full-time basis, leaving ETOUSA with a diminishing planning role. The prospect for ETOUSA had, therefore, become a dim one, its responsibility for operational planning having been passed to COSSAC, its command role destined in time to pass to the Supreme Commander, and its supply and administrative role having for some time already been exercised by SOS.

In late November and early December, letter orders issued by ETOUSA established that SOS would plan the mounting of the operation into Europe and that First US Army Group, known as FUSAG, would perform logistical planning for the support of ground operations in Europe. Advance Section of Communications Zone (ADSEC) was next established as a planning agency as the result of a COSSAC directive in late December 1943. The final stage was therefore set and all was ready for final action by the Supreme Commander himself.

When General Eisenhower returned to England to become Supreme Commander AEF, he ordered the ultimate reorganization of the European Theater by consolidating SOS and ETOUSA and making in effect the SOS staff, augmented somewhat from the former ETOUSA staff, his theater staff (see Chart 7). General Lee at long

last was made Deputy Theater Commander for Supply and Administration and the staff relationship between the strategic logistical planners, now in SHAEF, and the Theater Services became formal and inconvenient.

#### SHAEF, COM Z, and Post-Overlord

Supreme Headquarters Allied Expeditionary Force (SHAEF) was established 15 January 1944 and succeeded COSSAC with even greater executive powers to plan *Overlord*. Soon afterward, Forward Echelon Communications Zone (FECZ) was established under Colonel F. M. Albrecht, who had previously been the Chief US Administrative (logistical) Planner at COSSAC, to conduct the logistical planning required for the prospective continental communications zone. The new Chief US Logistical Planner at SHAEF, Colonel William Whipple, had been the chief planner for the Chief of Services SOS, so that whereas organizational ties had become roundabout and difficult, personal interrelationships were direct and easy.

The principal logistical planning agencies for the first 6 months of 1944, therefore, were coordinated by the strong influence of SHAEF and the friendly contacts of the key logistical planners (see Chart 8). 21 Army Group (British), which had over-all planning responsibility for the assault phase of *Overlord* (*Neptune*), had attached to it an administrative planning group from First US Army Group (FUSAG) and another from FECZ to represent and protect US interests in logistical planning on the operational level. Basic planning directives had been issued by SHAEF and completed plans were subject to review by SHAEF prior to approval.

By 6 weeks after D-day, SOS was operational on the Continent as Communications Zone (Com Z). The CG SOS had meanwhile been relieved from his dual role as Deputy Theater Commander. Theater or-

ganization was accordingly stabilized (see Chart 9) and planning was concentrated on post-*Overlord* operations, the object of which was "to undertake operations aimed at the heart of Germany and the destruction of her armed forces." Logistical planning was proceeding apace some 10 months in advance of current operations and was being coordinated by G-4 (Log Plans) SHAEF through command channels (see Chart 10).

Although Com Z ETOUSA was supposed to be the top US echelon in the theater, its position was somewhat ambiguous. On the one hand, because combat operations functions were to be handled exclusively at SHAEF, and because the Supreme Commander (as the US theater commander) tended to seek advice on all matters from his immediate staff, which was the US element of SHAEF, the US representatives in SHAEF came in many respects actually to serve as the senior US staff. On the other hand, the US Air Force and the Army Groups, although technically under the command of ETOUSA, looked to SHAEF as their next superior headquarters, a view which was intensified by the fact that ETOUSA was largely the former SOS headquarters for which the combat elements traditionally had little respect.

The final arrangement, therefore, was that G-4 (Plans) SHAEF performed strategic logistical planning for the US theater, as well as for the Allied Expeditionary Force, and he contacted the theater technical services through the Com Z ETOUSA general staff. This was not at all a satisfactory arrangement. Nevertheless, the theater strategic logistical planning section, about which there had waged so many furies of jealousy, distrust, and ambition, had finally come into its own and was now accorded the peace, dignity, and prestige required and deserved by its responsibilities.

Following the activation of Com Z, there was only one further modification of thea-

ter organization prior to VE-day. In February 1945, the Southern Line of Communications (SOLOC) was amalgamated with Com Z. SOLOC was the efficient logistical organization which had been supporting the Sixth US Army Group from MTOUSA by way of Marseilles and which had been operating the Continental Advance Section (CONAD) and Delta Base Section since a short time after 15 September 1944.

The SOLOC logistical planners replaced those of Com Z, and the G-4 of SOLOC became the G-4 of the new Com Z. Altogether, logistical planning in Com Z improved in efficiency and broadened in scope manyfold, so that in time Com Z recovered some of the responsibilities for theater strategic logistical planning which had previously been discharged by the G-4 Log Plans Branch SHAEF, leaving to the latter greater freedom for concern with post-hostilities occupation and reorganizational planning. Theater organization for logistical planning remained essentially as just described, unchanged until VE-day, when the entire system was remodelled for its postwar role.

### Conclusion

Thus, the organization of ETOUSA was evolved. It incorporated in its final framework the organizational weaknesses that inevitably result from mixing principles, personalities, and policies. But it was also

strong and effective because of its long-continuing theater mission, the deliberate process around which its policies and plans grew, and the personal relationships and contacts of its key personnel. From its experiences, certain salient lessons with respect to the organization of sound strategic logistical planning within a theater of operations can be deduced:

G-3 (Plans), G-4 (Plans), and the Technical Services should be kept in direct and close contact.

Staff organization should be stabilized and key personnel fixed in positions at an early date to enable continuous, effective planning.

Subordinate plans designed to support the strategic plan should be accorded less importance than the logistical plan for strategic operation.

Planning staffs should be given executive authority, endowed with powers to make policy decisions and to effect the implementation of their approved plans.

Basic strategic decisions and factors, such as target date and troop basis, should be announced early and kept reasonably constant.

The G-4 (Plans) section itself should be removed from current routine business so as to give it the quieter atmosphere essential for the preparation of its deliberate studies and formulation of its periodic appreciations.

---

The build-up of this force [in the United Kingdom], together with a corresponding accumulation of supplies of all kinds, involved a tremendous job of transportation . . . . An enormous administrative task was also involved, since facilities for quartering and training such large forces had to be provided . . . . The efficiency of the preinvasion build-up is exemplified by the speed with which units landing in Britain were provided with their essential arms and equipment. Through a system of preshipping and storing, the Army Service Forces were able to have equipment distributed and waiting for each unit on its arrival. Within a maximum of 30 days after debarking, divisions were fully equipped and ready for action.

*General of the Army George C. Marshall*



# Sociological Factors in Strategic Intelligence

Lieutenant Colonel Robert C. White, *Field Artillery*  
Instructor, Command and General Staff College

"Know then thyself, presume not God to scan,  
The proper study of mankind is man."  
—Alexander Pope.

PEOPLE are more alike than they are different. However, there are differences in the various peoples of the world, and for that reason, among others, strategic intelligence examines the peoples of foreign nations. It examines them collectively and not as individuals.

Sociology is the study of groups of human beings—their numbers and types, the activities of each group, and their character, habits, and attitudes. The actions of human beings are largely influenced by their social institutions and customs. These include such things as family, religion, education, trade unionism, caste, position of women, aristocratic privileges, and habits of thinking, to mention a few.

Sociology, then, covers a very broad field, and, as military men, we may not be interested in all of its aspects. Hence, intelligence in the sociological field is concerned with groups of human beings, their numbers, types, activities, and character, insofar as they have a bearing on the strategic capabilities and intentions of foreign powers.

For strategic intelligence purposes, it

is convenient to study groups of people under four headings: public welfare, public opinion, labor problems, and population and manpower. Each of these points will be developed, with a somewhat greater emphasis placed on population and manpower.

## Public Welfare

The public welfare element of the sociological factor embraces the protection of health, living conditions, education, social insurance, police functions, and the like. Though not normally a field of great direct interest to strategic intelligence, a knowledge of public welfare matters may be valuable in the production of other kinds of intelligence. Certainly, they are matters of interest to our troops and to our military government occupying a foreign country.

For a moment, let us examine one specific example under the heading of public welfare, namely, education in the Soviet Union. In the days of the tsars, the great mass of the Russian people were illiterate and little was done to improve their lot in this respect. The Bolsheviks, however, after the October Revolution of 1917, took a passionate interest in education and did much to raise the educational level of the

**Sociology is the study of groups of human beings. For strategic intelligence purposes, the study of groups may be confined to public welfare, public opinion, labor problems, and population and manpower**

people. Russia now claims better than 82 percent literacy for a population approaching 200 millions of people. This claim, however, is probably an exaggeration, and, by our standards, the level of education is still rather low.

What is the strategic significance of a high literacy rate? The Soviets partially answer that question for us. They stated that the main task of their educational system was to help to achieve the goals of their first 5-year plan launched in 1928. One of these goals was (and still is) "to overtake and surpass in the shortest possible historical period the most advanced capitalistic countries and thus to insure the victory of socialism in its historic competition with the system of capitalism." Certainly a nation with an educational system that produces scientists, technicians, artisans, skilled laborers, and literate soldiers has a much greater war potential than one in which there is much illiteracy, a lack of scientists, and few people with technical skills.

### Public Opinion

The national psychology of a country is an important driving force for peace and war. Many ingrained traits of the people go into what we call national morale and public opinion: national pride, national hatreds, religious beliefs and fanaticism, complacency, hero worship, aggressiveness, greed, and love of comfortable living. Intelligence must be produced on the state of national morale and public opinion (as distinct from the opinions of political leaders) as they bear on questions of national policy. Because public opinion—even in totalitarian countries—does set limits to political decisions, intelligence on public opinion is important. It has been proved that both public opinion and morale may be molded to fit a certain pattern by the clever use of propaganda, as demonstrated in Germany, Japan, and Russia. Such propaganda may therefore give an

indication of the ambitions of the men who are directing the propaganda.

Again, consider a specific example: What is the opinion of the Russian people toward war with the United States? A public opinion poll on this question would be interesting. We do not know the answer, but there is certainly evidence that the Communist leaders in the Kremlin are concerned with public opinion, perhaps even on this question.

We know that the Soviet leaders make great effort to reduce to the minimum contacts between their people and foreigners, both at home and abroad. Social contacts between the Russian and American soldier in occupied areas are forbidden by the Soviets. The number of Russian nationals who are permitted by them to come to this country, and to other countries outside the Soviet sphere of influence, is limited to those on strictly Soviet business. Those who are permitted to come are carefully screened so as to eliminate possible "deviationists." The Soviet government looks very unfavorably on Kravchenkos and Kasenkinas. Probably the most extreme step is the prohibition against Soviet women marrying foreign nationals, a custom that goes back to the days of barbarism.

Then too, the Soviet press is used to influence public opinion. The Russian people are given but one point of view, that of the Kremlin. Almost every day we see in our papers quotations from *Izvestia* and *Pravda* about Western "imperialism," "terroristic methods," or "hooliganism." These and other actions by the Soviets show their concern for public opinion. Such actions also indicate that the Soviets are endeavoring to form public opinion.

### Labor Problems

Labor problems are important to the users of strategic intelligence. The willingness of labor to work under conditions

fixed by management influences both the effective size and the productiveness of a country's labor force. Intelligence on labor problems is needed in order to determine the effectiveness of a country's labor supply. This kind of intelligence is based on the knowledge of the labor policies of both management and the government; the organization, strength, and control of the labor movement; and labor's attitude toward an actual or potential war effort. Intelligence concerning labor problems is of considerable interest to the researcher in the field of economics.

### Population and Manpower

The last broad field of study under the sociological factor is population and manpower. From the viewpoint of our top-level planners and policy makers, population and manpower is probably the most important sociological aspect of a foreign nation. Why? Because population is the primary resource of a nation in the conduct of war, both on the battlefield and on the home front. The war potential of a nation's population is determined by numbers and rate of increase; the birth and death rates; capacity to perform work; and the general economic setting—agricultural or industrial.

From an intelligence standpoint, it is the increase, stability, or decline in the size of a population upon which we first focus our interest. The future size of the population of a foreign nation may be of more importance to us than its present size. Knowledge of future size will help us to keep our estimate of a foreign power's war potential correct.

Consider what has been happening to the world's population in the past 150 years. We are living in a period of unparalleled (but uneven) growth in the world's population. Since 1800, the population of the world as a whole has more than doubled. This rapid, almost explosive, growth first started in Europe, where the

population since 1800 has trebled. The number of Chinese and Japanese has increased greatly, also, but their increase did not commence until well after the middle of the nineteenth century. In other regions, the timing of rapid population growth has varied.

The clue to rapid population growth is to be found in the changing relationship between birth rates and death rates. Before the Industrial Revolution, high birth rates almost negated high death rates, and there was little natural growth in population. The effects of the Industrial Revolution—in raising standards of living, sanitation, and health, and therefore in reducing infant mortality and in increasing life expectancy—were felt first in Western Europe, the United States, and Canada. Therefore, the populations of these areas increased rapidly during the nineteenth century. However, in more recent decades, because of cultural changes, such as the decline of the large family ideal, for example, there has been a drop in the birth rate. Thus, the margin between birth and death rates has been narrowing. The tendencies in these areas, therefore, is for population to level off, even to decline. With the extension of modern industrialization, sanitation, and medical care to other parts of the world, this same pattern of changing death and birth rates has appeared. Thus, China, India, the Soviet Union, and other areas more recently affected by industrialization are now in the stage of population growth that was characteristic of Western Europe several generations ago. It is likely that they, too, will in time pass into the stage of stable or even declining population.

The question may arise as to why the advent of industrialization, better sanitation, modern health facilities, and other factors, will bring about an increase in population, say in China or India. We think of modern industrial nations as nations of low birth rates, and such is the case.

As a nation develops from an agrarian economy to an industrial economy (as the USSR has been doing for the past 30 years), it goes from a period of high death and birth rates to one of low death and birth rates. In this change, death rates fall faster than birth rates; however, they both eventually reach a rather low level.

The reason for the lag in the fall of birth rates is that people accept material changes more quickly than cultural changes. The introduction of more efficient methods of industrial and agricultural production, improved sanitation, better medicine and hygiene bring about lower death rates. On the other hand, "family form and function, religious doctrine, and community custom are all focused toward the maintenance of high fertility. High evaluations are placed on the perpetuation of the family, clan, or other groups, but low evaluation on the individual and his welfare. These values are deeply imbedded and rigidly enforced by social sanction. Even under the impact of a rapidly shifting environment, they change only gradually."

In contrast, low birth rates have appeared only in those societies "dominated by the values developed in urban life. Such societies set great store by the individual, his health, welfare, initiative, and advancement. They develop a rational and materialistic outlook on life, view man as the master of his destiny, and come to hold the deliberate control of fertility to be as reasonable and desirable as that of mortality. The transition from the earlier set of values to the new individualistic ones is gradual. Therefore, universally, the decline in the birth rate lags behind that of the death rate until both reach rather low levels. The interim affords a period of rapid population growth. Europe is only now coming to the end of its period of expansion." Mortality and fertility rates and changes in them, and population and population changes which result from the mortality and fertility rates are the basic

data upon which we base our intelligence studies concerning population and manpower.

Now let us examine the population trend in two nations, one in which the number of people is decreasing and the other in which the number of people is increasing. In 1946, it was estimated that the population of the whole of Germany was about 66 million. This is an increase over the 1939 population in spite of war losses estimated at 2,850,000. The increase was due not so much from natural causes but to immigration, such as the movement of German people from Czechoslovakia to Germany. However, the present population is made up of a disproportionate share of women and old people. There are only 29 males for 37 females. The sex ratio becomes much more disproportionate in the middle-aged group of 18 to 50 years, where the males constitute but 30 percent of the group rather than a normal 50 percent. Bear in mind that it is this age group that is the most important\* to a nation, not only economically as the producers of goods, but also demographically as producers of children.

Besides the present number of people and the age-sex ratio, there are many other factors which will affect the future size of Germany's population. In general, the effect of these factors will be to cause the population to decline. Germany's food supply has been quite inadequate, and it appears that it will remain so for some time to come. There is a great housing shortage, and health and sanitary conditions are unsatisfactory. These are conditions that cause death rates to rise.

In Berlin, in the first quarter of 1947, the death rate was nearly three times as great as the birth rate, 28.5 deaths per 1,000 but only 10.7 births per 1,000. During the same period, infant mortality was 116 per 1,000. Compare these rates with the rates for New York City in 1946: death rates, Berlin 28.5, New York 10.1;

birth rates, Berlin 10.7, New York 19.6; infant mortality, Berlin 116, New York 27.8.

Then, too, economic conditions are, and will be, such as to deter people from marrying. Those who do marry will have fewer children than they normally would have. As a result of the present economic and social conditions in Germany, one population expert estimates that by 1980 the German population will have fallen to below 40 million. So, where Germany is only second to Russia in population size in Europe today, in one or two generations her numbers will be reduced to where she is fifth—behind the Russians, the British, the Italians, and probably even the French.

The population of the Soviet Union today is estimated by our Census Bureau of the Department of Commerce at 193 million. This is an increase of more than 20,000,000 over her prewar population in spite of enormous war losses. The increase is due, of course, largely to the annexation of new territory, the Baltic countries, part of Poland, Bessarabia, and other areas.

In contrast to Germany, the Soviet's population is increasing, and it is expected that it will continue to increase for a considerable time to come. Population projections indicate that by 1970 the Soviet population may reach 250 million. Of this number, 84 million will be men in that important economic productive age bracket of 15 to 64 years, whereas in the United States there will be but 53.7 million men in the same age bracket. It is also estimated that the number of men of military age in the Soviet Union will have increased by 13 million in 1970 over 1940, for a total of 43 million. Again comparing with the United States in this age bracket for the same period, the increase in this country

will be less than 2 million or to a total of 24.1 million. On the basis of numbers alone, we are at a considerable disadvantage.

Numbers alone are not sufficient in themselves to properly determine the capabilities of a nation's population. We must know something about the quality of the people—their educational level, industrial skills, and attitudes—subjects that were mentioned earlier in this article. Then, too, we want to know where the people are—how the population is distributed throughout the country. Look back for a moment and consider the distribution of people in this country prior to the recent war, and recall the mass movements of people to the centers of war industries. War production requires a readily available labor market.

Lastly, there is a special demographic problem growing out of intelligence on manpower potential—the size and quality of the labor force. It concerns itself with the numbers having the necessary skills for war production, for agriculture, for the civilian economy. Also of importance are the number of men that can be drained off from the labor force for the armed services. These are but a few of the considerations in this particular aspect of manpower.

Basic population data are expressed by such factors as the total number of people, the size of the various age-sex groups, and birth and death rates. Such data are insufficient as a basis for the intelligence officer to estimate the military and industrial manpower potential of country. In order to determine the ability of a people to produce goods and to fight, he must examine the public welfare program, the manner in which public opinion is molded, the moral fiber of the people, and lastly the relationship between labor and management.

# The Infantry Division in Defense

## An Illustrative Problem

Lieutenant Colonel Selwyn D. Smith, Jr., *Field Artillery*  
Former Instructor, Command and General Staff College

THE following map exercise, with modifications, was presented to the regular class at the Command and General Staff College. The problem was designed to review the basic tactical principles of the defense by the application of those principles to an infantry division, a part of a corps, in the organization, occupation, and defense of a position. Maps and coordinates listed herein are for the reader's convenience if the designated maps are available. However, the specific maps referred to are not required for an understanding of the problem.

### General Situation

1. MAP.—PENNSYLVANIA, 1:50,000, LANCASTER-McCALLS Ferry (see Map 1).

2. GROUND FORCES.—*a. Enemy.*—The enemy advanced south and southeast into Blue territory in the direction of LANCASTER (91.0-50.0) and on 25 Jun reached an east-west line about 25 miles north of LANCASTER. The enemy attack is continuing with one of his principal efforts being directed towards LANCASTER.

*b. Blue.*—(1) The LANCASTER area is included in the Blue First Army sector. First Army, an interior army, has been assigned a defensive mission preparatory to later Blue offensive action.

(2) On 25 Jun, Blue V Corps, a part of First Army, completed its concentration in the WILMINGTON area (about 40 miles southeast of LANCASTER). At this time, the Commanding General, First Army, directed V Corps to organize, oc-

cupy, and defend the line of PEQUEA Creek from NEW MILLTOWN (14.0-46.0) inclusive to PEQUEA (located on east bank of SUSQUEHANNA River just south of WISE Island). V Corps consists of the 2d, 4th, and 9th Inf Divs, the 12th Armd Div, and supporting troops.

(3) Blue First Army has ordered the forces in contact to hold Red north of the line: TERRE HILL (15.5-63.5)—LANCASTER—SAFE HARBOR (84.1-36.8) until dark on 3 Jul.

3. AIR FORCES.—*a. Enemy.*—The enemy has air superiority and is capable of furnishing strong support to his ground forces.

*b. Blue.*—The principal Blue air effort is being directed toward gaining air superiority.

4. Both the enemy and Blue units are organized and equipped in a manner similar to United States units.

### Special Situation

1. You are the Commanding General, Blue 2d Inf Div. At 260700 Jun, you receive orders from V Corps to move after dark on the night of 26-27 Jun to the vicinity of GREENTREE (13.2-35.3) and prepare to defend the sector indicated on Map 1.

2. All streams in the division sector are fordable with difficulty.

3. The weather for the period 26 Jun—5 Jul is expected to be hot and dry.

### The Battle Position

1. As Commanding General, 2d Inf Div, you first consider the tactical organization



of the division sector. The major decisions you must make are the location, composition, and size of the force to garrison the main battle position, the location of positions to be prepared by the division reserve (division blocking positions), and the location and composition of the division reserve (see Map 2).

2. NUMBER OF REGIMENTS EMPLOYED ON THE MAIN BATTLE POSITION.—You make the decision to employ two regiments on the main battle position because: the width of the division sector is too great for one regiment to defend with mutually supporting positions in both width and depth; the natural defensive strength of the division sector is favorable for a position defense on maximum frontages and is within the capabilities of two regiments; the use of elements of three regiments on the main

The sector of the 2d Inf Div has good observation, excellent fields of fire, and a suitable obstacle in front of the main battle position. Therefore, units in the main battle position can defend on maximum frontages.

Since the width of the division sector is just under 11,000 yards, two regiments can be used on the main battle position with one regiment in reserve. A plan involving the use of three regiments or two regiments and one battalion of the third regiment on the main battle position is not justified because of the natural strength of the area, the fact that the maximum frontage has been exceeded by only 1,000 yards, and the resultant reduced effectiveness of a division counterattack force.

3. BOUNDARY BETWEEN REGIMENTS.—See Map 2.

***The defense requires a position that blocks an enemy advance, and it is organized into security, main battle position, and reserve echelons. The counterattack, however, is the decisive element in a defense plan***

battle position will unnecessarily weaken the division counterattack force.

Defensive doctrine contemplates the organization of a main battle position to be held against enemy attack. The number of regiments to be employed for the defense of the main battle position will necessarily be determined by the width of the division sector and the natural defensive strength of the main battle position. The natural defensive strength of a position stems from the availability of suitable obstacles, good fields of fire, observation, cover and concealment, and routes of communication. On terrain which possesses natural defensive strength, a regiment can occupy, organize, and defend with mutually supporting positions a maximum frontage of about 5,000 yards. Any lack of these characteristics will correspondingly decrease the width and depth of the area that can be defended by a regiment.

The principal consideration involved in the location of the boundary between regiments is to ensure that responsibility for related critical terrain features in the main battle position and the approaches thereto is not divided between regiments.

While it is frequently not possible to include both the avenue of hostile approach and the adjacent dominating terrain in the sector of small units, sectors assigned to battalion and larger units must ensure unity of defensive dispositions and fires in defense of these critical localities. Otherwise, the unit responsible for the defense of a critical locality will not be able to fire at an enemy using the approach to that locality without continually obtaining a clearance from the unit in whose sector the approach lies.

In the main battle position of the 2d Inf Div, there are two different areas which contain related critical terrain and whose

retention is vital to the maintenance of the main battle position: the ridge running east-west between HARRISTOWN (12.0-45.0) and VINTAGE (12.5-44.3) and the smaller ridge culminating in the hill 1,000 yards east of KINZERS (14.1-43.9); and the hills at (07.4-43.5), (06.8-43.2) and (07.1-42.4). The boundary shown on Map 2 does not divide responsibility for either of these related terrain features nor does it divide the approaches thereto. Since the right half of the division sector has the greatest natural strength, it is appropriate that this regiment have the larger of the two areas to defend.

The boundary is drawn to the rear to include the rearmost positions of the regiments occupying the main battle position (about 3,000 yards) and is extended to the front to include as a minimum the approximate limits of observation from the positions of the combat outpost.

The limiting point between regiments has been placed on the boundary between regiments at the point where the boundary intersects the main line of resistance (PEQUEA Creek). This limiting point is a feature which can be easily identified on the ground (a group of buildings on the banks of PEQUEA Creek). At this point, the two regiments occupying the main battle position will coordinate their defense.

**4. INFANTRY BATTALION DEFENSE AREAS IN THE MAIN BATTLE POSITION.**—In order to verify the adequacy of your plans for the organization of the main battle position, you, the division commander of the 2d Inf Div, must visualize the general locations of the infantry battalion defense areas (battalion "goose-eggs") within the main battle position.

The visualization of the location of the infantry battalion defense areas in the main battle position is shown on Map 2. The areas include all the critical terrain features in the main battle position, and they assign the responsibility for the defense of a single terrain feature and ap-

proaches leading into the main battle position to only one unit.

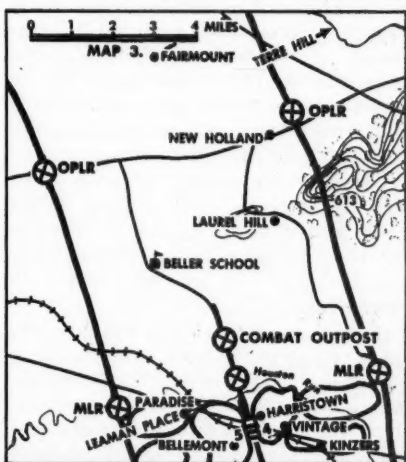
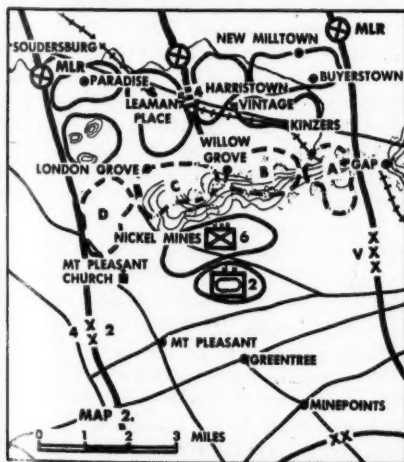
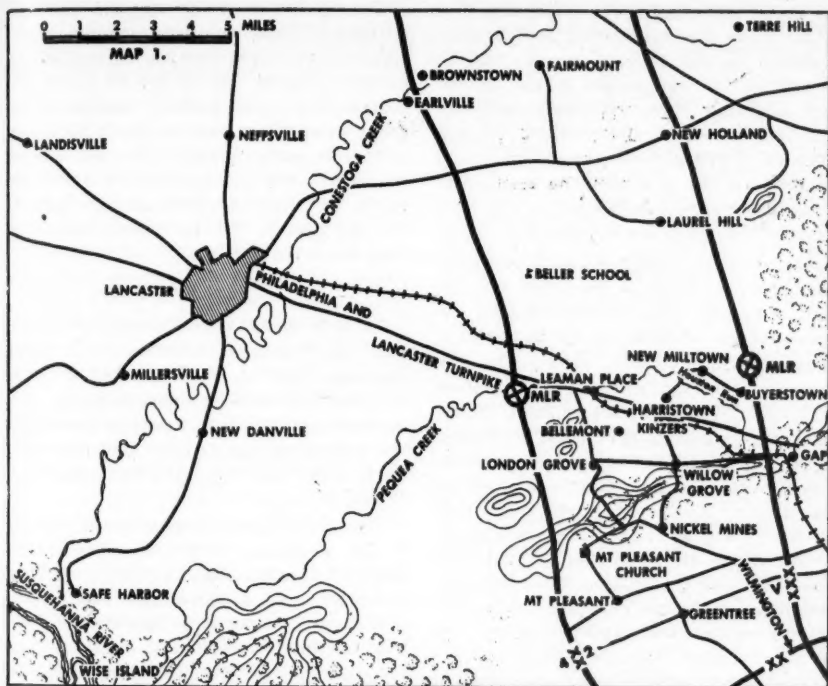
It was necessary to assign the defense of the ridge running east-west between HARRISTOWN and VINTAGE to two battalions because of the length of the ridge. It is not felt that responsibility for the defense of a critical terrain feature has been divided because of the length of the ridge, the fact that the dominating portion of the ridge has been assigned to the battalion on the left, and since no major entry exists in this portion of the sector.

The visualization of the defense areas in the right regiment's sector can be varied. The solution shown on Map 2 envisages the possible use of an additional company from the reserve battalion of the right regiment to strengthen the area to be occupied and defended by the right forward battalion of that regiment.

**5. POSITIONS TO BE PREPARED BY THE DIVISION RESERVE.**—With respect to the sector assigned to his division, you, the Commanding General, 2d Inf Div, will indicate certain areas to be prepared by the division reserve. These areas, located for the defense of the approaches to the critical terrain in rear of the main battle position, are shown on Map 2.

The critical terrain to the rear of the regimental sectors in the main battle position consists of the wooded ridge which runs generally southwest-northeast from MT PLEASANT Church (08.3-38.3) to GAP (18.1-42.1). The approaches to this ridge are formed by the corridors which extend northwest from the ridge.

If the enemy is successful in penetrating to the rear areas of any portion of the main battle position, positions must be occupied which will slow and stop the penetration in order to prevent the capture of the critical terrain to the rear and to enable and assist the execution of a division counterattack. Since the critical terrain running from MT PLEASANT Church to GAP is too far to the rear to accomplish



the above, and because of considerations of fields of fire and observation, the positions prepared by the division reserve will be located on the approaches to the critical terrain in rear of the main battle position.

**6. LOCATION AND COMPOSITION OF THE DIVISION RESERVE.**—As the Commanding General, 2d Inf Div, your decision as to the locations and composition of the division reserve are shown on Map 2.

The division reserve normally has two concurrent missions in the defense of the division sector: the occupation and defense of one or more of the positions it prepared under division control (to stop an enemy penetration); and the execution of division counterattack plans. Therefore, the division reserve must be located in a defiladed, centrally located area which is readily accessible to any one of the blocking positions and to the attack position of any of the counterattack plans. However, the situation and terrain may make advisable the location of the infantry battalions of the reserve regiment in battalion reserve areas dispersed laterally in the reserve area, thus facilitating and expediting the movement of any one battalion to the nearest division blocking position without reducing the coordinated effectiveness of the final employment of the entire reserve. This position must also be located so as to provide protection against a surprise armored attack and maximum protection possible against air attack.

Occupying the division blocking positions with the entire division reserve prior to an enemy penetration will interfere with the reserve's missions by committing it to the ground in an area exposed to enemy action.

The location of the reserve will take into account its ability to move to the flanks or rear of the division sector. However, the reserve will not be located in an area which will interfere with its primary missions unless the threat of vertical or flank envelopment is strong.

The 6th Inf, after the regiment (minus) withdraws from the outpost line of resistance, will constitute the nucleus of the division reserve. The 2d Hv Tk Bn is also placed in division reserve because of its great power as a counterattack force. It is further contemplated that when one of the division counterattack plans is put into effect, one company from the 2d Engr C Bn and the 7th FA Bn will be placed in support of the 6th Inf.

### Security

**1. OUTPOST LINE OF RESISTANCE (GENERAL OUTPOST).**—*a. Location.*—The Commanding General, V Corps, has directed you, the Commanding General, 2d Inf Div, to give your recommendations regarding the location of the outpost line of resistance. You recommend the location shown on Map 3.

This location was recommended because it has excellent observation, long-range fields of fire, and many covered routes of withdrawal to delaying positions in the rear, and because it favors coordination with the logical locations of the OPLR's of the adjacent divisions. However, it has the disadvantage of lacking an obstacle.

A general outpost line in rear of CONESTOGA Creek between (10.8-62.6) and EARLVILLE (00.5-59.2) is satisfactory. However, although this location has the advantage of an obstacle, it has the distinct disadvantage of lacking covered routes of withdrawal in the western (left) portion of the division sector.

A location generally along the ridge line from the high ground at (14.5-53.5) through BELLER School (06.9-51.4) has observation, fields of fire, and an excellent obstacle. However, this location is not considered as suitable as the two described above because valuable terrain favoring delaying action is given up to the enemy with no benefit to the mission of the outpost line of resistance force.

Any location for the general outpost

force which is to the rear of BELLER School ridge is not satisfactory because of the distance from the main battle position and the loss of good delay positions to the front.

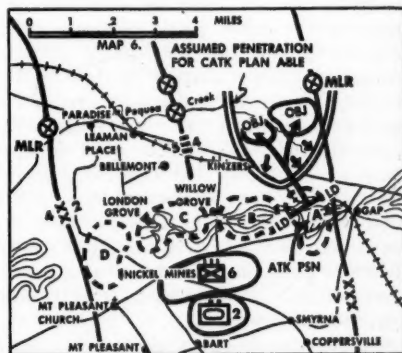
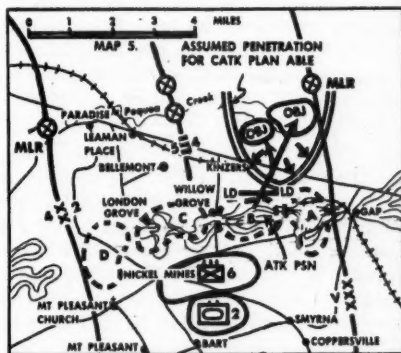
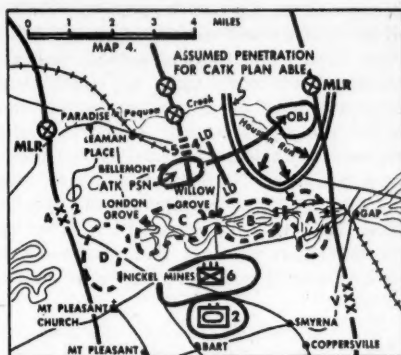
The mission of the general outpost force is essentially one of delay. The mission will be accomplished by the use of mines, obstacles, and by fire. The force must not become closely engaged with the enemy because it has insufficient forces to defend with mutually supporting positions in a sector the width of the 2d Inf Div's zone; and, if closely engaged, the outpost force will have difficulty in withdrawing to a new delay position and subsequently to its reserve position.

*b. Composition.*—You designate the following units to comprise the general outpost force: 6th Inf (minus one battalion) reinforced with the 7th FA Bn, one battery from the 2d AAA AW Bn, the 2d Ren Co, and one company from the 2d Engr C Bn.

Any combination of elements from the 6th Inf and the 2d Hv Tk Bn is acceptable as the nucleus of the general outpost force provided that a battalion of the 6th Inf, as a minimum, is withheld as an initial division reserve. If a battalion of the 6th Inf and the 2d Hv Tk Bn (or the 2d Hv Tk Bn, minus) comprise the nucleus of the general outpost force, the over-all commander must be designated and adequate command facilities must be provided for the designated commander by either augmenting his organic headquarters or by including a headquarters as part of the task organization.

The use of infantry elements from either of the regiments assigned to the main battle position is not acceptable. They must be employed to organize the position prior to the enemy attack and their defense of the main battle position must not be jeopardized by employment on the outpost line of resistance.

One light field artillery battalion has been attached to the general outpost force



because of its distance from the remainder of the division and because of the need for close liaison and communication. The attachment of more than one light field artillery battalion is not acceptable because their missions of supporting the regiments on the main battle position might be jeopardized. No medium or heavy field artillery was attached because the fires of these calibers will be made available by the battalions which in this situation can be emplaced forward of the main battle position.

A solution which attaches more than one antiaircraft artillery battery and more than one company from the 2d Engr C Bn is not desirable. Both the 2d AAA AW Bn and the 2d Engr C Bn have missions incident to the organization and occupation of the main battle position which are concurrent with the mission of the general outpost force.

**2. COMBAT OUTPOSTS.**—You, the Commanding General, 2d Inf Div, coordinate the location of the combat outposts of the division as indicated on Map 3, by the limiting point on the boundary between regiments. You selected this location because of the observation and the ability of the main battle position to support the combat outposts by fire.

Current doctrine states that combat outposts, detailed from the regiments occupying the main battle position, cover the foreground of the battle position when the general outpost is at a considerable distance from the main line of resistance, or when the enemy situation prevents the establishment of a general outpost, and when battle is interrupted by nightfall. The mission of the combat outposts is to provide local security or, when there are no friendly troops to their front, to perform those duties of the general outpost which their strength and location permit.

In this situation, the security forces of the 2d Inf Div include a general outpost.

Therefore, the combat outposts of the division will provide local security for and observation forward of the main battle position. Placing the combat outposts forward of the location indicated on Map 3 will be too far from the main battle position for the mission which it is to perform.

### Conduct of the Defense

**1. COUNTERATTACK PLANS.**—After all plans for the organization and occupation of the battle position and its security are completed, you next consider division counterattack plans for the conduct of the defense in your division sector.

As the basis for the preparation of these plans, your division G-3 has selected three assumed enemy penetrations in the division sector, two in the east (right) portion of the division sector, and one assumed penetration in the west (left) portion of the sector. The three counterattack plans for the three assumed penetrations will be labeled counterattack plans Able, Baker, and Charlie.

Your division G-3, in conjunction with the commanding officers of the 6th Inf and the 2d Hv Tk Bn, has prepared tentative partial plans for the execution of each of the three counterattack plans. Shown on Maps 4, 5, and 6 are three tentative partial plans for the execution of Counterattack Plan Able. G-3 recommends to you that the plan shown on Map 4 be approved as the basis for Counterattack Plan Able. You approve G-3's recommendation.

The direction of attack on Map 4 strikes the enemy penetration as much in the flank as is possible without causing the counterattack force to attack through a battalion defense area that has been prepared for all-around defense. Since the greatest enemy strength will be disposed at the nose of the penetration, the flank attack envisaged in Map 4 will strike the enemy at the point of his estimated great-



est weakness; on the other hand, the main attacks on Maps 5 and 6 will strike the enemy in the area of his greatest estimated strength.

The main attack of all plans must cross the corridor formed by HOUSTON Run in order to restore the position completely. However, the main attacks on Maps 5 and 6 must cross additional corridors and will necessarily be exposed to more fire than will the main attack on Map 4 which will utilize the shoulders of a ridge.

On Maps 5 and 6, the accessibility of the reserve position of the counterattack force to the attack positions and the suitability of the attack positions are doubtful from the viewpoint of enemy action. The attack positions in both plans are located on a forward slope in an occupied division blocking position. The approaches from the reserve position to these attack positions are on the same forward slope and coincide with the direction of the enemy penetration. However, it is felt that both plans might be workable because of the available concealment and the fact that the attack positions will probably be occupied prior to the time that the enemy penetration reaches the depth shown.

2. USE OF POSITIONS PREPARED BY THE DIVISION RESERVE.—Subsequently, you approve your division G-3's recommendations for the basic plans of Counterattack Plans Baker and Charlie and concurrently consider several basic factors in connection with the use of the positions prepared by the division reserve blocking positions in the conduct of the defense. You first examine these positions with respect to Counterattack Plan Able.

If the enemy attacks in the area of the assumed penetration for CATk Plan Able and if, in your judgment as division commander of the 2d Inf Div, it becomes necessary to order the occupation of suitable positions prepared by the division reserve, you will order the occupation of positions A and B, or portions thereof. The purpose

of the positions prepared by the division reserve is to stop the enemy penetration in order to prevent capture of critical terrain in rear of the main battle position, and to permit execution of the division counterattack plan. The approaches to the critical terrain threatened by the enemy penetration are blocked by positions A and B. Occupation of only one of these two positions will not block all approaches to the critical terrain. Position C will not be occupied because the approaches which it blocks are not immediately threatened and the occupation of a third position will reduce the strength and effectiveness of the division counterattack force.

If, as a result of an enemy penetration in the area assumed in CATk Plan Able, you, the Commanding General, 2d Inf Div, order the occupation of one or more of the positions prepared by the division reserve, the nucleus of the force used for the occupation of the position(s) will be a battalion of infantry from the 6th Inf. A battalion from the division reserve, the 6th Inf, is used as the nucleus force for the following reasons: the division reserve prepared the positions; the force occupying the positions will fire in the area of the penetration in support of the counterattack force, the 6th Inf (-), which, from the viewpoint of the 6th Inf, is simplified by having one of its battalions occupy the positions; using a battalion of infantry from the 5th Inf to occupy the blocking positions will unnecessarily weaken the left portion of the division's main battle position and invite penetration by the enemy; while the elements from the two overrun battalion areas in the 4th Inf's sector may be used to supplement the nucleus force, they obviously cannot be depended upon to form the nucleus because of their possible disorganization and losses; and the 2d Hv Tk Bn is not a satisfactory force because it is essential as part of the division counterattack force (with the 6th Inf) and because of the un-

suitability of its equipment and organization for the defense of a position.

If the enemy attacks and penetrates in the area of the assumed penetration in CATk Plan Able, you, the Commanding General, 2d Inf Div, will order the occupation of the positions prepared by the division reserve and place CATk Plan Able into effect when the situation indicates that the enemy attack will reach the extent and depth of the assumed penetration. The division commander must make the decision to occupy the blocking positions and put the counterattack plan into effect prior to the time that an enemy penetration reaches the extent and depth of the assumed penetration. Otherwise, the positions can not be occupied without enemy interference and in time to stop the enemy attack. The division commander will not order the occupation of the division blocking positions nor will he place CATk Plan Able into effect when the enemy attack begins or when one of the forward battalion defense areas has been penetrated. Intervening countermeasures will be taken by the regiment to stop the enemy penetration and to eject the enemy from the main battle position. If this fails, and, if in the judgment of the division commander, the enemy attack will continue and reach the depth and extent of the assumed penetration, the division blocking positions will be occupied and CATk Plan Able will be placed into effect.

### Summary

The defense requires a position which will block the enemy advance or will require him to execute a time-consuming maneuver. A position which the enemy can easily by-pass is worthless.

Terrain plays a primary role in the defense. It must work for the defender and against the attacker. Through superior observation, fields of fire, and obstacles, the defense endeavors to compensate for

inferiority in numbers, equipment, or training.

The defense is organized into three echelons: security, the main battle position, and the reserve.

Security forces include all elements forward of the main battle position. They include the advanced covering force, the general outpost, and combat outposts. In general, the missions of these forces is to delay, deceive, and disorganize the enemy. They usually avoid serious engagement. The situation does not always permit employment of all three echelons. Sometimes, it is necessary to pass to the defense on the line of contact; in that case, none of them are possible. At other times, an advanced covering force may be impracticable. Occasionally, there may be situations where only a combat outpost is employed. But insofar as the situation permits, a commander employs a security echelon in front of his main battle position.

The main battle position is organized into a series of defense localities which are mutually supporting, both laterally and in depth. These areas are located so that they hold the critical terrain features necessary to the defense. No commander ever voluntarily gives up his assigned sector unless ordered to do so by his superior commander. The forward edge of the main battle position is called the main line of resistance. Immediately to its front is a zone of highly organized fires and obstacles, the area where the full weight of the defense exhibits itself.

The holding out of reserves is an integral part of the defense. Reserves give the defense mobility and flexibility and enable the commander to influence the action. Reserves are designated by units within the main battle position, as well as by the division. Units from the division reserve are often employed on security mis-

sions initially. Defensive doctrine contemplates the vigorous and aggressive employment of all reserves from the battalion up in counterattack. Sometimes, they may have to be employed in a blocking role or to extend the flanks.

The counterattack is the decisive ele-

ment in the defense. It is the expression of the offensive spirit in defensive combat. It is the active part of the defense. Once the enemy has penetrated the main battle position, it is only through counterattack that the main battle position can be restored.

---

We are confident that any war of the future—as never before—will be total and will touch whole populations to a degree hard for us in the U. S. even to imagine. Certainly, we know from the last two world wars that they were not fought solely by people in uniform. And even the greatest proportion of people who fought it in uniform were civilians a few short months or years before the pay-off. It cannot then be considered as just a responsibility of the regular forces. It is the responsibility of all of us.

*General J. Lawton Collins*

---

The Army's combat role is basic to both defensive and offensive action. Ground units must hold and defend the bases and vital areas on which depend our nation's existence; they must seize and hold successive bases from which air and sea power can be concentrated against the vitals of an aggressor nation. And even then, no victory is assured until the man on the ground takes possession by his physical presence on the enemy's soil.

*General Omar N. Bradley*

# SALVAGE

Lieutenant Colonel James D. Sams, *Ordnance Department*  
Former Instructor, Command and General Staff College

**S**ALVAGED material can contribute greatly towards victory in a war and towards economy of military funds in peacetime. Before discussing the ways in which salvage can be utilized to the advantage of the Army, it is necessary that the reader have a thorough understanding of the term "salvage."

The latest draft of Field Manual 100-10 has this to say of salvage: "Salvage consists of recovered material which can be used for the original purpose either with or without repair and material which can be converted to a substitute use or which has value as scrap." This statement conforms to the dictionary definition that salvage is "that which is saved."

All too often, Army personnel apply the term salvage to material which is to be discarded or destroyed. For military purposes, however, the word salvage is applied in three ways: (1) material saved, (2) the act of saving material, and (3) as a verb meaning "to save."

The mission of salvage service is threefold:

1. The prompt recovery and saving of government property, serviceable or unserviceable, which has been abandoned or lost by friendly forces.
2. The exploitation of captured equipment and supplies.
3. Utilization of waste and scrap.

Why is the conservation of materials of war which have reached the combat zone

so necessary? In the first place, especially in World War II, the lines of communication from the Zone of Interior to the theaters were long. It is reasonable to expect that, in any future war, the lines of communication will be equally as long or longer. Regardless of the length of the lines of communication, transportation is vitally important, but the longer the line of communications the more critical is the transportation. It is easy, therefore, to see that any item salvaged in the combat zone or in the communications zone eliminates the necessity of shipping a like item from the Zone of Interior. This, in turn, makes shipping space available for some other item badly needed in the theater.

In the combat zone, critical shortages of certain items of equipment or supply can occur very quickly. With a long supply line, it is always extremely difficult and sometimes impossible to relieve such shortages quickly by appealing to the Zone of Interior. An efficient salvage system reduces the frequency of such shortages to a minimum.

Finally, salvage operations can result in a huge saving of money to our government.

## As a War Aid

Let us see a few ways in which an efficient salvage system can aid in the war effort. The aid rendered may be tactical, strategic, and economic. Many salvaged items of equipment may be made available

for issue immediately upon recovery. Other items, after being inspected and classified, must be cleaned, laundered, serviced, or repaired before they are available for issue. Still others are nonrepairable but are valuable for purposes other than their original use. These latter items may be reduced to their component parts or unit assemblies, and the serviceable components may be made available for the repair of like items. This course of action was used extensively by the Ordnance Department in all theaters, being especially helpful in maintenance of automotive equipment.

Clothing and other items of individual equipment can be repaired and reissued or be turned over to civil affairs or military government sections. Other material which might only be classified as waste or scrap can still be made useful. There is

covered on the battlefield. In the combat zone, the salvage of urgently needed items should be stressed and priority given to such items in all salvage operations, both routine and battle area. The prompt return of critical items from salvage to supply channels can influence favorably the outcome of an operation. On several occasions in the European Theater of Operations, intensive campaigns were conducted for the salvage of 5-gallon gasoline containers.

After salvage items have been collected, they are first sorted according to the technical service which procured them. After sorting, the material of each technical service is classified by representatives of that service as to serviceability. The usual classifications into which recovered material is divided are: (1) usable when recovered; (2) usable after being cleaned,

***An efficient salvage system helps to conserve a nation's resources. Salvaged material can contribute greatly toward victory in time of war and effect marked savings of military funds in time of peace***

always a great demand for rags around all types of maintenance installations. Scrap metal is valuable in that it may be returned to the Zone of Interior when scrap is critical. Scrap might also be made available to our allies in assisting them in getting their steel and other metal industries into operation.

#### **Salvage Operations**

Salvage operations are divided into two broad categories: (1) routine salvage, and (2) battle area salvage. The objective of routine salvage operations is to save everything that can be used to aid the war effort. Routine salvage operations are carried on continuously in the Zone of Interior, in the communications zone, and in rear areas in the combat zone. The objective of battle area salvage is to collect, classify, and dispose of materials re-

laundered, or serviced; (3) repairable; (4) nonrepairable, but usable for some purpose other than that for which it was originally intended; and (5) waste or scrap.

There are two channels for the movement of salvage from the place of recovery back into supply channels. These are the salvage channel and the maintenance channel. Material moving through salvage channels goes from the unit recovering it to salvage collecting points where it is sorted and classified. After the sorting and classifying in collecting points is completed, usable material goes direct to supply channels. That which is repairable in the combat zone goes to maintenance establishments. After being repaired, it is sent to supply agencies. Items not repairable or not usable in the combat zone are evacuated to the communications zone

for repair or disposition. Recovered items may be turned in direct to appropriate maintenance establishments. Usable items are returned immediately to supply channels. Other items remain in maintenance channels until they are repaired and returned to supply channels or turned into salvage channels as nonrepairable.

### Salvage Agencies

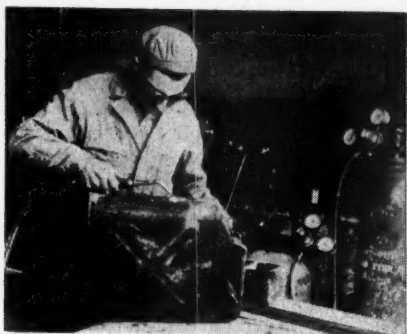
What agencies are provided for the recovery and reclamation of equipment and material to be salvaged? There are a few units especially designed for such work. The Quartermaster Salvage Collecting Company, T/O&E 10-187, with attached personnel from other technical services, is designed to receive and classify all classes of salvage at salvage collecting points and depots. The Quartermaster Salvage Repair Companies, semimobile (T/O&E 10-237) and fixed (T/O&E 10-317) are designed for the repair of Quartermaster items of equipment. There is also the Ordnance Evacuation Company (T/O&E 9-187). The latter unit has the dual function of delivering tanks and other heavy equipment to forward units and installations and of evacuating the same types of equipment to repair shops.

However, the starting point in an efficient salvage system is the combat unit. The combat unit can and should recover a large proportion of material in the battle area. Material which cannot be collected and turned in by the combat unit, due to lack of time, labor, or equipment, should be safeguarded as much as possible and promptly reported to the next higher echelon. Empty transportation going to the rear should be utilized for transporting salvage materials. Returning ammunition and other supply vehicles, or supply vehicles going to supply points for issue, should be used. For this reason, salvage collecting points should be near army supply points.

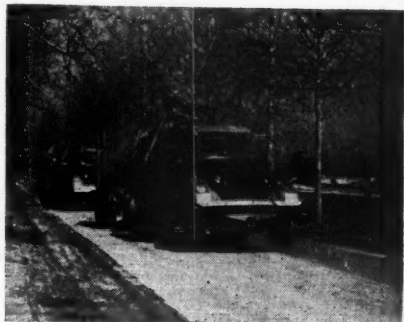
From the time it is collected on the battlefield until it reaches its final destination, salvage should be screened carefully for any explosive or dangerous material which might be included. Where large quantities of scrap or excess supplies are returned to a base section or port without such screening, the port must set up special labor groups to remove dangerous items. The necessity for such screening was learned the hard way, that is, by explosions while loading, on ships during transit, while unloading, or even after reaching scrap segregation centers in the Zone of Interior. The necessity for such screening at ports or rail terminals causes congestion in the transportation system as well as increasing labor demands. There have been instances of fuzes, fuzed projectiles, unserviceable ammunition, and other hazardous material being returned to the Zone of Interior mixed with scrap. Lives have been lost because of this, and such losses should have been avoided.

Another agency which can and does help in salvage operations is the forward medical installation. In Normandy, shortly after the landing, both casualties and loss of equipment were running high in the 4th Infantry Division. Loss of small items of individual equipment was especially high. It was a practice to collect daily all weapons left at the collecting and clearing stations. A considerable number of weapons were collected, but practically no small items such as watches and grenade launchers were recovered. The shortage of grenade launchers became critical. Knowing that soldiers habitually carried these launchers in their pockets when not in use, the Ordnance Officer asked the medical personnel to search casualties for these and like items. Immediately, the number of such items recovered increased many times. Grenade launchers and watches had simply been evacuated to England in the pockets of the casualties.





Effective salvage operations reduce shipping requirements, relieve shortages, and save money. Upper left, Fifth Army soldiers are shown recovering gasoline cans in Italy. Upper right, a welder is repairing a leak in a salvaged gasoline can. On the right, ordnance recovery vehicles are moving salvage materials to collecting points. Below, on the left, tanks recovered from the battlefield are shown in an ordnance collecting point. Lower right, nonrepairable tanks are being disassembled so that serviceable parts can be used to repair other tanks.—US Army photos.



### Ordnance Salvage

Due to its nature, ordnance matériel, both ours and that of the enemy, requires special consideration. It comprises, by far, the greatest bulk of salvage materials. Many items of extremely heavy equipment are ordnance, and only the ordnance service has equipment to handle such heavy equipment in the combat areas. Dangerous items, such as explosives and ammunition, should be handled only under the supervision of specially trained personnel.

In the European Theater, ordnance

equipment was sent to maintenance units for repair; and nonrepairable equipment was stripped to component parts, unit assemblies, and scrap, or it was evacuated to the communications zone.

During World War II, there was no suitable ordnance unit organized under a T/O&E for the operation of an Ordnance Collecting Point. However, during the war, personnel of Army Ordnance Service became convinced that such a unit should be formed for wartime operation. The Theater General Board of the European Theater strongly recommended the forma-



Upper left, salvaged brass artillery shell cases are being brought alongside a ship in a Mediterranean port for return to the United States. Upper right, a German remote controlled tracked vehicle captured on Utah Beach in Normandy; troops must guard and report such enemy matériel for intelligence purposes.—US Army photos.

service operated its own collecting points. There was an enemy ammunition section and an unserviceable ammunition section in each ASP of First Army. A collecting point for ordnance matériel, other than ammunition, was operated in rear of each corps; another was operated near the main army shop area in the Army Service Area. These collecting points were operated by an Ordnance Medium Automotive Maintenance Company, with armament and combat vehicle personnel attached. After being classified, serviceable items were sent to supply installations; repairable

tion of such a unit, to be called an Ordnance Salvage and Reclamation Company. Such a company has been proposed and is included within ordnance service for the Type Field Army.

Likewise, there was no ordnance unit which was suitable for battlefield recovery of heavy items of ordnance equipment. The armored maintenance battalion of the armored division does have equipment suitable for recovery, but these units generally moved forward before all equipment could be recovered in their area.

Realizing the need for such a unit even

prior to the Normandy landings, First Army obtained authority to reorganize and equip four Ordnance Evacuation Companies into units specially suited for battlefield recovery and evacuation to Ordnance Collecting Points. These companies were designated as Ordnance Evacuation Companies (Collecting). They had their own reconnaissance sections which reconnoitered the combat area, contacted combat units, and notified company headquarters of locations of matériel to be evacuated.

### Tactical and Supply Savings

These units performed an extremely valuable service from the standpoint of both tactics and supply. A single company recovered more than 50 tanks and tank destroyer vehicles from the Hurtgen Forest Area, near Aachen, in a period of about 3 weeks. Most of these vehicles were in a heavily mined area which had to be cleared during the reclamation. The money value of this project alone amounted to more than \$3,000,000. The European General Board submitted a separate report on this type unit and strongly recommended the adoption of such a unit to be called an Ordnance Recovery Company. The Ordnance Recovery Company, like the Salvage and Reclamation Company, has received tentative approval.

Here are a few other figures on the money value of salvaged materials in specific instances. In the army service area of Fifth Army alone, one salvage collecting company salvaged and returned to issue channels \$1,045,130 worth of material in a period of 2 weeks in January 1944. In all, more than \$30,000,000 worth of supplies were salvaged in the Fifth Army. This figure represents only those supplies which were repaired and returned to issue channels within the Army Area and does not include those evacuated to the Communications Zone. During 1945, sales of junk articles only, such as glass, paper, tin, and scrap iron amounted to

more money than was spent by the Army during fiscal year 1939-1940 in the development of new weapons, planes, and other items. Sales of junk in 1945 amounted to more than \$10,000,000, while our development program in 1939-1940 amounted to only \$7,500,000. Complete figures on the money value of materials saved and the tonnage of shipping saved are not yet available, but using the few instances cited as a yardstick, one can safely assume that the savings ran into millions of dollars.

### Captured Material

Captured materials are handled through salvage channels and in a manner similar to that described above. However, there are certain items of enemy equipment which require special methods of handling:

1. Dangerous material, or material which might be of particular advantage to the enemy in case of recapture, must be guarded and disarmed or destroyed. Its destruction must be a decision or policy of the commander concerned. Near Marburg, Germany, a salvage depot and repair installation was set up in the middle of a German shell loading plant and ammunition dump in which there was an estimated 100,000 tons of ammunition in various stages of completion. A canvas repair shop was set up in one end of a building and in the other end there were melting pots, still partly filled with TNT. Such occurrences are extremely dangerous.

2. Items of new or unusual design should be processed through technical intelligence channels. The technical services have teams especially designed for this work. However, combat troops and salvage collecting units must be trained to be on the alert for such items and to report them immediately to the proper technical service. Much valuable material was destroyed during World War II due to the troops not recognizing its value or usefulness to our forces.

3. Clothing and other captured items are searched for documents, maps, orders, and other papers or items that might have intelligence value. Such items should be processed through intelligence channels.

4. Usable captured materials should be placed in supply and maintenance channels and utilized to the utmost. A few of the captured supplies which proved of considerable assistance to our Army in Europe were:

a. Vehicles, a large number of which were turned over to Civil Affairs and Military Government and used to transport food and other necessities for civilians and liberated slave laborers.

b. Food and clothing, which were used to feed and clothe the civilian population and inmates of slave labor and concentration camps.

c. Materials such as metal stocks, welding materials, and explosives, which were used in routine maintenance and service functions.

d. Equipment, such as electric generators, optical instruments, and even guns and ammunition, which were issued to our combat troops and used against the enemy.

An excellent example of salvaging enemy material can be found in the hedge-row cutters with which our tanks and tank destroyer units were equipped at the time of the St. Lô breakthrough. The story of this was told in an article in the *MILITARY REVIEW*, May 1948.

The above cited examples of savings made by salvage operations are only a few instances of the many which occurred all over the world. These savings during the war should be considered less from the viewpoint of saving money than from the

viewpoint of saving men's lives and aiding in strategic and tactical accomplishments. Recognizing that salvage operations did contribute greatly to the winning of the war, we must remember that more efficient operations could have contributed even more.

### Improving Salvage

During peacetime, when money plays a far more vital part in the training and equipment of our army than during a war, we must develop an efficient salvage system in which every individual must play his part. A few suggestions for greater savings through salvage operations are offered:

1. Salvage discipline is a command function. It plays a vital role in salvage operations. Commanders and their staffs must be thoroughly familiar with the value of an efficient salvage system.

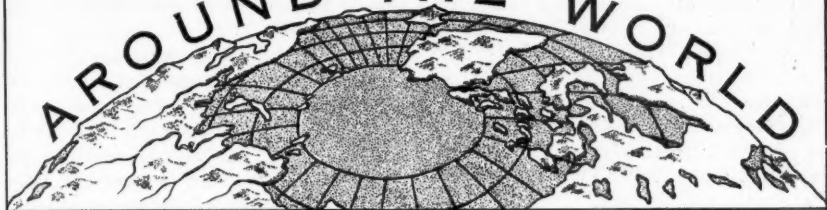
2. A salvage program should be planned thoroughly, all troops should be indoctrinated with its importance and with proper procedures, and the execution of the plan should be supervised by commanders and their staffs.

3. Troop units, designed to operate salvage installations in wartime, should be planned during peacetime. Such units should be activated quickly in wartime and thoroughly trained for their missions.

The natural resources of this country are not unlimited. Another major war will deplete them much further and may even exhaust certain items which are essential to our national prosperity. An efficient salvage system, although not a "cure-all," will certainly help in conserving our resources.

# MILITARY NOTES

## AROUND THE WORLD



### UNITED STATES

#### Miniature Radio

A radio receiver and transmitter so small that it fits into a king-sized cigarette package has been disclosed by the Army Signal Corps Engineering Laboratories of Fort Monmouth, New Jersey.

The tiny "transceiver," weighing only 11 ounces, will transmit and receive spoken messages over distances greater than 200 yards. It is believed to be the only radio of its size in the world that contains in one package all necessary component parts, including the power supply.

Other sets of comparable size receive but do not transmit. Moreover, they use batteries weighing several pounds which must be carried separately. The new Signal Corps miniature transceiver has two "B" batteries, one "A" battery, a 2-foot collapsible whip antenna that folds into the case of the set, four subminiature tubes, plus the usual internal radio components. All this is contained in a metal case that is only 1 inch thick, 2¼ inches across the base, and 3½ inches high.

The set also has a built-in speaker and microphone. The lid of the radio case opens slightly to become the bell of the speaker and the opening through which the voice messages reach the microphone.—Office, Chief Signal Officer.

#### Civilian Components

The Secretary of Defense has created a Civilian Components Policy Board to coordinate all policy and programs of civilian components of the armed forces.

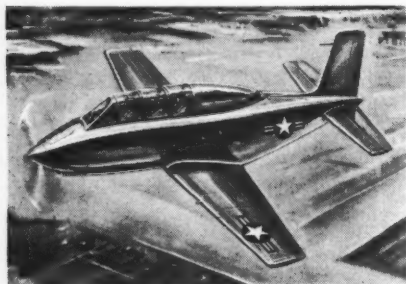
The Board, which will be permanent, is authorized to study and evaluate all questions affecting the organized reserves of the Army, Navy (including Marines), Air Force, and the National Guard, both ground and air.

The Board will consist of a civilian chairman, a military executive officer, and 18 other members comprising 2 officers from each of the reserve components of the Army, Navy, Marine Corps, and Air Force, 2 officers from the Army National Guard and 2 from the Air National Guard, and 2 Army, 2 Navy (1 from the Marine Corps), and 2 Air Force officers from the regular establishments. The Board will function on a full-time basis.

The purpose in creating the Board is to develop and coordinate, in the Office of the Secretary of Defense, all policies affecting civilian components of the armed forces. The Board will facilitate coordination of plans and programs of the civilian components with the strategic concepts of the Joint Chiefs of Staff.—National Military Establishment.

### High-Speed Trainer

The US Air Force has contracted for the development of a two-seater training plane which will possess flying characteristics more closely approaching those of tactical aircraft. The new Douglas XT-30 is a single-engine conventional low-wing monoplane. It is powered by a Wright R-1300 engine rated at 800 hp at take-off. The engine, immediately aft of the cockpit, drives the propeller by a shaft which is under the cockpit floor.



Douglas XT-30.—US Air Force photo.

The XT-30 will have a top speed of 286 mph at 10,000 feet and a service ceiling of 29,600 feet. The trainer's wing span is 36 feet, 4 inches, and its length is 36 feet, 9½ inches.—Department of the Air Force.

### Radioactive Counter

With the Atomic Energy Commission offering \$10,000 rewards for each acceptable discovery of uranium deposits, a growing army of amateur prospectors annually is buying more than \$200,000 worth of a new-type Geiger counter designed to aid them in their search for the deposits.

The instrument, called a nuclear "sniffer," weighs 2 pounds, can be carried in a coat pocket, and generates 1,200 volts from two flashlight batteries. In the presence of uranium and other radioactive substances, the counter emits clicks through a head set.—*The New York Times*.

### New Rocket Fuels

Ocean-spanning rockets, and even rockets that may circle around the earth and remain aloft for weeks, may be looked upon as probabilities.

In order to cross the ocean, a rocket would have to gain a speed of about 9,000 miles an hour shortly after take-off. To circle the earth like a miniature planet at, say, 1,000 miles altitude, a rocket speed of 22,000 miles an hour is necessary. With a little more speed, 25,000 miles per hour, the rocket could be sent to the moon or into outer space. The great essential in acquiring these speeds is proper fuel.

Only a fuel like hydrogen has the potentiality of giving a rocket the necessary acceleration to allow it to escape from the earth, although some other fuels might be used. Hydrogen itself would accomplish the job more easily if one or more "booster" rockets are employed to accelerate the main rocket before its own engine starts firing.

Liquid hydrogen is ordinary hydrogen gas converted to a liquid by cooling it below its boiling point, which is a minus 423 degrees Fahrenheit. It looks like water but is only one-twelfth as heavy. It is completely noncombustible and nonexplosive by itself but burns with intense heat in contact with liquid oxygen.

The exhaust from a liquid hydrogen-liquid oxygen rocket can obtain a speed in excess of 8,000 miles an hour, which is 50 percent greater than that obtainable by the use of alcohol as a fuel, as in the German V-2.

However, it is possible to impart even greater speed to the rocket since it can be shown that the rocket obtains a speed higher than its exhaust when the weight of the propellant used for the rocket exceeds about 65 percent of gross weight before take-off. With a 96 percent propellant load, the rocket can move at three times the exhaust speed.—News report.



## Guided Missile Range

Activation of the Banana River, Florida, Air Force Base, Long-Range Proving Ground, which may become one of the most important missile research centers ever contemplated, was announced recently by the Air Force after deliberations lasting more than 3 years (MILITARY REVIEW, June 1949, p. 68).

While the new base will be under the administrative control of the Air Force, maintenance, personnel, and research activity will be a joint effort of the Army, Navy, Air Force, and other government research agencies.

In announcing activation of the base, the Air Force said: "By mutual agreement among the governments of the United Kingdom, the Bahamas, and the United States, and with the concurrence of the Governor of the Bahama Islands, down-range instrumentation (observation) stations will be located on publicly-owned lands on various islands of the Bahamas."

Initially (1949-1950), it is planned to install such stations on Grand Bahama and Great Abaco. Additional stations will be installed on Eleuthera and Cat Islands in 1951-1952.

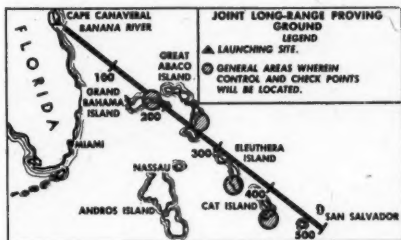
Each down-range observation station will consist of a communication tower, instrumentation platforms on which instruments will be mounted to observe the flight of the missiles, and buildings to house 125 people. Most of this number will be civilian scientists and technical personnel who will operate the complex communication and instrumentation system.

In addition to sites located on Bahama public lands, the US Air Force may construct access facilities, including jeep trails, roads, stations, and pole lines for communication wires to and from observation towers. A small dock and ramp will be provided for landing supplies and personnel from seaplanes and small craft at

the most suitable beach nearest to the main stations.

When the test area is in full operation, it will be possible to detect the passage of missiles by means of special observing instruments. The test missiles will carry instruments to measure performance, but no armed missiles will be launched.

With missile "impact areas" far at sea, extensive precautions still will be taken to prevent accidents which might cause injury or property damage. A large portion of the Cape Canaveral launching area is being acquired solely in order to provide a clear 5-mile safety area around the launching point, which will be on Cape Canaveral proper. In addition, the entire length of the range through the Bahamas will be under



visual and radar surveillance during test flights in order to avoid possibility of collision with aircraft, or missiles landing in the vicinity of any surface craft.

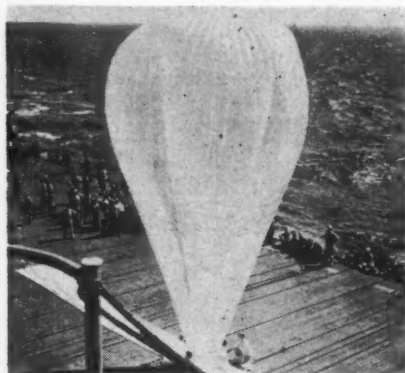
There will be devices to control the flight of the missile continuously. Should these central devices fail, the missile will be destroyed in the air before leaving the safe range area, or diverted from its course to land at sea.

The Air Force has set a target date of 1 July 1951 as the time the Joint Long-Range Proving Ground should be ready for extensive guided missile tests, although limited tests may be made before then.—*Armed Force.*

### Cosmic Ray Research

High-altitude plastic balloons, which reached altitudes exceeding 90,000 feet, have been launched from a US Navy aircraft carrier in the Caribbean area. This was part of a cosmic ray research project being carried out under the direction of the Office of Naval Research.

The balloons, which have a diameter of 70 feet when fully inflated, carried cloud chambers to record the cosmic radiation in the upper air. Made of Polyethylene, they must be handled with great care until airborne. The instruments are released



Preparing a high-altitude balloon for launching from carrier.—US Navy photo.

after a predetermined period by a timing device and descend by parachute.

All flights carried photographic plates which were sensitive to cosmic rays. The data has not been fully analyzed, but the scientists conducting the flights are well pleased with the preliminary information.

The project was designated Operation *Skyhook* from the name of the 100-foot balloons, which have been used previously in research experiments conducted at Camp Ripley near Minneapolis, Minnesota.—Department of the Navy.

### New Carrier Plane

Combining the heaviest concentration of torpedoes, rockets, and machine guns ever incorporated in a single engine carrier-based aircraft, the Martin AM-1 *Mauler* recently underwent carrier tests on the USS *Kearsarge*.

With a gross weight of more than 22,000 pounds, roughly the equivalent of conventional, twin-engine, prewar commercial airliners, the *Mauler* is one of the heaviest airplanes ever designed exclusively for carrier duty.

Powered by a single Pratt and Whitney



Martin AM-1 *Mauler*, largest single-engined carrier aircraft.—US Navy photo.

R-4360-4 engine, the *Mauler* has only the pilot for crew. Except for guns mounted in the leading edges of the wings, all armament is carried in shackles under the wings and fuselage.

The *Mauler* has a wing span of 50 feet 1 inch and is 41 feet, 6 inches long and 16 feet, 11 inches high. It has a range of more than 2,000 miles and a maximum speed of more than 300 miles per hour.

The three torpedoes carried by the *Mauler* have a combined weight of 6,270 pounds, and the 12 rockets weigh a total of 1,674 pounds.—Department of the Navy.

### Pilotless Ram Jet

The longest sustained flights ever made by pilotless aircraft powered by ram jet engines were accomplished by almost wingless missiles tested by the United States Navy at the Naval Air Missile Testing Center at Point Mugu, California.

The missiles, designated PTV-N-2a (Gorgon IV) have made several sustained controlled flights of more than 10 minutes. They were piloted by remote control and tracked by radar.

Free flight was obtained by launching from a mother airplane, and flight information was telemetered back to a ground receiving station by an electronic "brain."

The ram jet engine (MILITARY REVIEW, December 1948, p. 70) was designed at Navy direction to operate the Gorgon IV at subsonic velocities. The tests were conducted to obtain engine performance information during controlled free flight.

The PTV-N-2 (Propulsion Test Vehicle) was designed, developed, and built, except for the engine, by the Glenn L. Martin Company. The ram jet Gorgon IV engine, sometimes called the "stovepipe," was developed at the University of Southern California, and the engines used in the Navy-Martin tests were manufactured by the Marquardt Aircraft Company. Except for a fuel pump, the ram jet has no moving parts and depends for its thrust on a difference in momentum between the entering air and the exhaust gases.

The Gorgon IV is an all-metal high-winged monoplane, 22 feet long, with a wing span of 10 feet. Gross weight is 1,600 pounds, 700 pounds of which is ordinary 80-octane gasoline (116 gallons), the ram jet fuel. After the initial ignition of this fuel by the spark plug, the burning and thrust are continuous until the fuel is exhausted.

The circular ram jet on the Gorgon IV is suspended below the fuselage. It is 7

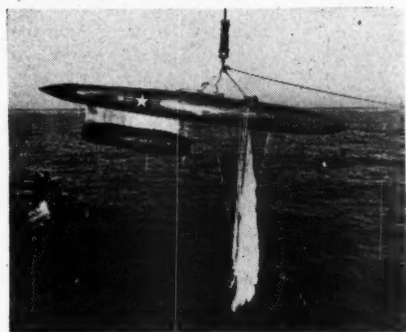
feet long and 20 inches in diameter at the widest point.

The ram jet has no static thrust and therefore can not take off under its own power. It must be given velocity before launching.

The missile is controlled in flight from a ground station, but it may be preset



Above, Gorgon IV in flight over Pacific Ocean; below, recovering missile after parachute landing.—US Navy photos.



to perform normal flying functions, such as level flight, dives, banks, and turns. Radar is used to follow the flight path from a ground station. The Gorgon is equipped with a conventional rudder and elevator but uses spoiler ailerons for lateral control.—Department of the Navy.

### Buying Fresh Foods

Supplying the Armed Forces with fresh foods constitutes a business which during the past year involved an average expenditure of \$31,000,000 a month. This operation, organized on a nationwide basis and geared to the high speed of modern communication, is a valued World War II contribution to the present-day military establishment.

Known as the Market Center System and operated by the Army Quartermaster Corps, this organization purchases, ships, stores, and supplies virtually all the perishable subsistence required by the Army, Air Force, Navy, and Marine Corps. In addition to the regular Armed Forces, the Market Center System supplies perishable foods for National Guard organizations while they are in camp, as well as for certain civilians who are entitled to buy from Army commissaries, and for use in the Greek aid program.

The Army defines perishable foods as those requiring refrigeration in shipment and storage. They include fresh meats, vegetables, fruits, fish and other water foods, dairy products, and frozen fruits and vegetables. Nearly 100 different kinds of food items aggregating about 150,000,000 pounds a month are regularly supplied.

The purchases are made from all over the United States and, under circumstances defined by law, from foreign countries. With information constantly at hand concerning the availability and market prices of every type of fresh food needed by the Armed Forces, the system is able to buy commodities at seasonal production peaks and effect balances by shifting procurement from items in short supply to others that are more abundant.

The effect of the system upon the feeding of the military personnel is important. An abundance and wide variety of the finest fresh foods are delivered to military

installations speedily and in prime condition. Spoilage has been reduced to a fraction of 1 percent.

The Market Center Program came into existence in April 1941 as a result of planning by the Office of The Quartermaster General and the Office of Production Management (later the War Production Board).

Every serviceman requires about 5 pounds of food a day. In the Washington offices, a master menu, suggesting the composition of every meal for each day of the year, is made up in advance and delivered to the military installations 6 months in advance. Field headquarters in Chicago, working from the master menu, compute how much of every type of fresh food will be required to supply each installation.

These computations are transmitted to the Market Centers, scattered about the United States and strategically located in the important food-producing areas. They are situated at Columbia, South Carolina; Denver, Colorado; Fort Worth, Texas; San Francisco and Los Angeles, California; New Orleans, Louisiana; New York, New York; Richmond and Williamsburg, Virginia; and Seattle, Washington. Williamsburg is also the port for European shipments.

The Market Center System has resulted in numerous economies and advantages. By purchasing in large quantities, important discounts are obtained. Shipping in car-load lots reduces transportation costs. Inspection at points of origin eliminates rejections at posts, camps, and stations. Centralization and organization hold communication expenses to a minimum. Personnel is most economically employed. The program also has prevented disruption of civilian supplies in periods of low production.—Department of the Army.

Nav  
T  
offic  
wer  
such  
The  
Wes  
S  
and

Bay  
and  
for  
whe  
head  
min  
Eng  
Nav  
ish,

## WESTERN EUROPE

### Naval Maneuvers

The Western Union naval maneuvers, officially described as Exercise *Verity*, were the first peacetime collaboration of such a kind ever to be held by Allied navies. The occasion typifies the solidarity of Western Union.

Ships of three nations, Britain, France, and the Netherlands, anchored in Mount's

The main force of warships of three nations proceeded to the Bay of Biscay. The object of the exercise was to accustom Western Union naval units and maritime air forces to working together in defense of a convoy against submarine, surface, and air attack.

Four squadrons of Coastal Command,



Some of the Western Union ships at anchor before putting to sea. When in full progress, more than 100 ships and 22,000 men were involved in the exercise.

Bay, off Penzance, England. Harbor drills and exercises were arranged in preparation for the maneuvers which began on 4 July, when the ships put to sea in six groups headed by destroyers. Simultaneously, minesweeping exercises took place in the English Channel. Units of the Belgian Navy participated in this phase with British, French, and Dutch minesweeping craft.

two jet squadrons of Fighter Command, and *Lincolns* and *Lancasters* of Bomber Command made up the British Royal Air Force contributions to the exercise.

All Allied air operations were controlled from Area Combined Headquarters at Plymouth and Brest.—*The Illustrated London News*.

## FRANCE

### Uranium Discovery

The Commissioner of Atomic Energy announced recently that France would become self-sufficient in atomic raw materials.

The Commissioner said, however, that enthusiastic announcements to the effect that a new strike of uranium ores in central France would put her in first place among the atomic nations were "premature." He confirmed that a vein of pitchblende assaying at 20 percent uranium had been found some 15 miles from Limoges. Until this strike, the only uranium extracted from French soil had come from much poorer ores.

While the extent of the vein will be determined accurately only after extensive research, the Commissioner said that an "important and promising strike... means that the monopoly of atomic energy is broken and that France can take her place among the leaders in the world's production."—*The New York Times*.

## GERMANY

### Television Eye

German scientists during World War II developed a television device similar to the human eye for controlling guided missiles or aircraft, but it was never used. The device was built into missiles such as bombs and guided them toward a preset target without outside help. It used a movable mirror which reflected the target to a television tube. This tube transmitted electrical impulses to the missile's steering device.

The pilot aligned his target in the television picture in his sighting mechanism, switched on the bomb's steering device, and released the bomb.

The entire device was no bigger than 8 inches in diameter and weighed only 4 pounds. Some were as small as 5 inches in diameter.—*The New York Times*.

## SWEDEN

### New AA Gun

The Bofors Company of Sweden has developed a new anti-aircraft gun. This weapon is a 120-mm (approximately 4.7 inches), high and low angle, quick-firing weapon. It is the first example of adopting the fully automatic principle to a gun larger than 40-mm.

The new gun is credited with solving the problem of defense against jet planes and missiles of the V-2 type. Its greatly increased rate of fire and the speed with which it can be directed against flying targets makes it much more effective than the fastest guns formerly in use.—*Irish Defence Journal*.

## NORWAY

### Armament Exchange

In a recent armament exchange, Norway delivered six batteries of 88-mm anti-aircraft guns and one battery of 105-mm field artillery guns to Denmark. In return, Norway received a number of 380-mm gun tubes which the Germans had installed in Denmark on the Kattegat Straits.

These heavy guns are being installed along the Oslo Fjord and will greatly increase the effectiveness of the coast artillery installations in that vicinity.—*Military Orienting*, Norway.

## AUSTRALIA

### Flying Bombs Tested

Research scientists of the Division of Aeronautics are perfecting one of the world's most advanced types of guided missiles, the "flying wing" bomb. The "flying wing," modeled on modern flying wing aircraft, will have a warhead, jet engines, and radio control. The scientists are expected to test the "flying wing's" engines by the end of 1949. Later, they will test the "flying wing" on the South Australian rocket range.—*Australian Weekly Review*.



## GREAT BRITAIN

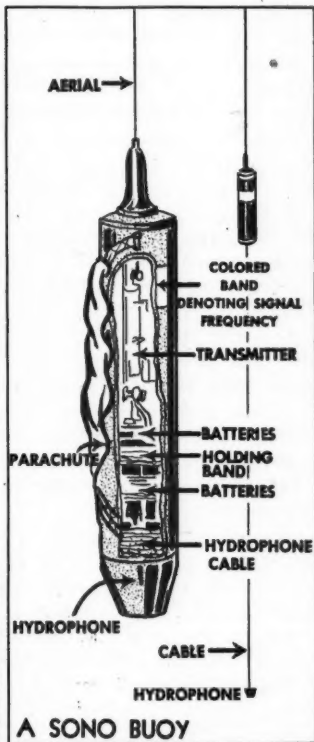
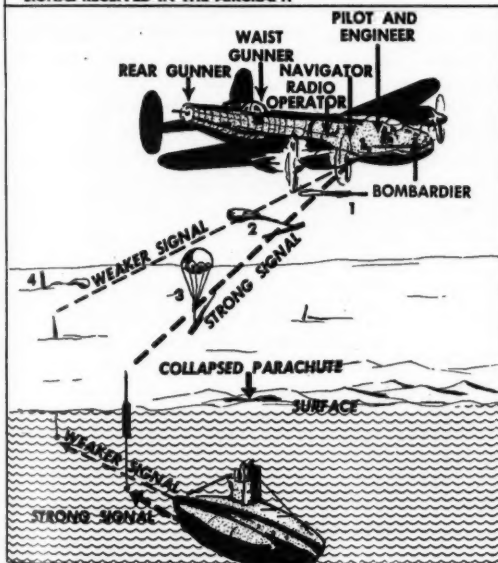
**"Sono" Buoy**

One of the most jealously-guarded secrets of World War II was the "Sono" buoy, a device which proved to be of considerable value. In its improved form, it may be the means of countering the increased efficiency of the modern submarine.

to a long cable which unwinds when the buoy strikes the sea. The hydrophone picks up the noises made by any submarine moving in the vicinity and a signal is transmitted to the plane that dropped the buoy. By noting the position of the "drop"

**THE SUBMARINE HAS BEEN LOCATED BY A "LANCASTER" BOMBER WHICH PROCEEDS TO DROP SONO BUOYS AS THE BOAT DIVES.**

**EACH BUOY HAS ITS DISTINCTIVE SIGNAL FREQUENCY—THE NEARER THE BUOY IS TO THE SUBMARINE THE STRONGER THE SIGNAL RECEIVED IN THE AIRCRAFT.**



"Sono" buoys are an important weapon against new submarines. An invisible "net" of the buoys encircles the submerged submarine and reports its movements to patrolling aircraft.

The buoy consists of a tubular casing containing a small wireless transmitting set.

A small parachute decreases the speed of the buoy's fall from a plane. In the base of the buoy is a hydrophone attached

and the strength and frequency of the signals received, the plane crew can locate the submarine and direct surface craft in an attack.—*The Illustrated London News*.

## USSR

**Army Strengths**

The military correspondent of the *London Daily Telegraph* gives what is believed to be a reliable estimate of the strengths of the armies of countries under the influence of Russia. They are as follows:

Yugoslavia.—Organized as 30 field divisions, of which several are motorized or semi-armored; strength about 220,000 men.

Bulgaria.—Organized as 8, low category, Balkan divisions of about 4,000-5,000 men each; total strength perhaps 60,000 men.

Rumania.—Organized as 10 low category divisions (6 infantry and 4 motorized); strength perhaps 75,000 men.

Hungary.—Organized as 1 infantry division, 1 artillery division, 4 district headquarters (expandable into divisional headquarters), and 14 frontier battalions; total strength perhaps 30,000. Expansion is planned to a strength of 50,000 by autumn 1949, and 70,000 by mid-1950. The last figure would be 5,000 above treaty limitation. The Army is designed for internal security rather than for large-scale operations, the primary object of the expansion being to make existing units thoroughly efficient and mobile.

Czechoslovakia.—Organized as 14 divisions; these include frontier troops and also several district headquarters. It is significant proof of communist mistrust of western influence that, since the communists took over the government, the strength of the officer corps has dropped from 10,000 to 8,000, mainly through desertion; the strength of the Army generally is from 110,000 to 150,000. During the same period, the strength of the SNB or semi-military armed police has risen from 20,000 to over 60,000.

Poland.—Organized as 14 divisions; strength about 140,000 men.—*Journal of the Royal United Service Institution*, Great Britain.

## BRAZIL

**Manganese Deposits**

There is plenty of high-grade manganese in newly discovered deposits near the mouth of the Amazon in Brazil. The deposits are much nearer to the United States than most other manganese sources, and their development would free the United States of a need for the Soviet supply.

Manganese is an essential metal in the manufacture of steel alloys and it plays an important part in other products. The United States has domestic deposits but the known reserves are far too small to meet the demands. More than 1,500,000 tons are imported normally each year. Russia is the principal source of supply.

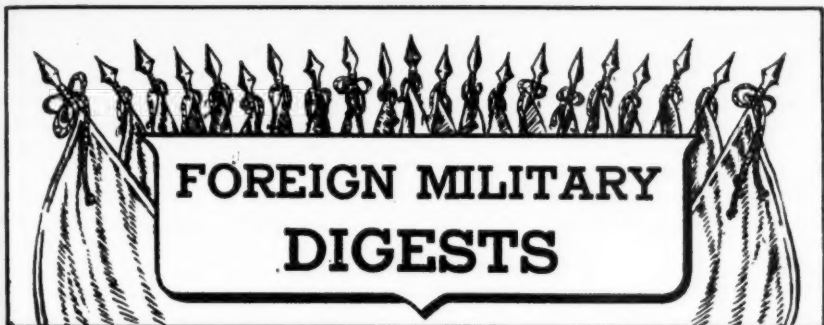
India, the Gold Coast of Africa, the Union of South Africa, Cuba, Chile, and Brazil are other sources. In prewar days, Russia produced approximately one-half the manganese ore used in the world.

Brazil has a great deal of manganese. Present mining is in an area in western Brazil near the Paraguay border and in a region north of Rio de Janeiro. The new deposits are in the territory of Amapa between the Amazon and the Guianas.

The Brazilian federal government a year ago authorized Brazilian companies to begin exploring these Amapa deposits. With its other deposits, Brazil has much more manganese than needed to satisfy domestic needs. These deposits may be of great and strategic importance to the United States.—*Science News Letter*.

**Shale-Oil Deposits**

A plan for large-scale development of Brazilian shale-oil deposits is being worked out by the Companhia Industrial de Rochas Betuminosa of Sao Paulo. The company estimates that the average content of Brazilian shale is 10 percent crude petroleum, while United States deposits, as those in Colorado, are said to be only about 8 percent.—*The New York Times*.



## Economy and the Conduct of War

Translated and digested by the MILITARY REVIEW from an address by M. Ramadier, French Minister of National Defense, at the inauguration of the National Defense Institute of Higher Studies; published in "Informations Militaires" (France) 25 January 1949.

THE institution which we are inaugurating is not an entirely new school, but it is an institution which is certainly more daring in its goals than in the past.

You gentlemen are the heirs and successors of an organization which was usually called the Marshals' School before World War II. That school was similar in organization, composition, and purpose to the present institution.

Nevertheless, I must say that in its programs and its composition, the Marshals' School was probably more specifically military in character. Technique constituted only one of the elements—and not the principal one—of its activity. As a matter of fact, it existed more for the purpose of initiating a soldier who had attained a certain rank in the civilian problems of national defense than for the purposes of general instruction.

Today, our reason for inviting you to participate in this common effort is that we must profit from the lessons drawn from the experiences of 6 years of war and 4 postwar years.

As a matter of fact, I believe that it has become quite obvious that war today is no longer an affair for the military alone. It is no longer confined to a particular

technique, whatever may be the internal changes which this technique has undergone, or whatever may be the importance that war matériel has assumed.

If armies are not up to strength at the time of an act of aggression, everything is uncertain. But military preparedness alone cannot be regarded as a decisive element. Indeed, as we saw in World War I, the economic element has become dominant in international and military affairs. But, if World War I revealed the force and value of the economic element, World War II and the years which followed it revealed the value of two other elements: scientific research, and the purely political factor.

We hope you will select for reflection and study one of those subjects which is in line with your personal experiences. There is no intention of conducting regular academic-type instruction at this school. You will not be presented with any doctrines, but subjects will be submitted to you. The Practical School of Higher Studies can, perhaps, serve as an example. Men of all ages gather there, not for instruction, but for research. Research, in itself, often teaches more than academic instruction.

An understanding of the problems mentioned above will draw the attention of the French government to matters which have heretofore been neglected. The contacts which you will establish here will be of the highest value to you. The government, the administration, and the armed forces will obtain information from the attention given to these problems, and far-reaching reforms will be developed. In any case, we look forward to new discoveries which will correct certain of our views relative to the conduct of war, particularly from the political and economic points of view.

### The Economic Field

First, let us consider the economic field. Since World War I, the decisive importance of the industrial wealth of a country has been too well known to require any emphasis. The prolonged efforts made at Geneva by the League of Nations to bring about international disarmament revealed the importance of this concept of war potentiality. This potentiality is not represented by economic strength alone, although it does play a very fundamental role. How fundamental this role is was illustrated by the experience of the United States during World War II.

In 1939, the United States was neutral, but it possessed those necessities whose lack had been very troublesome in France's preparations for war. The neutrality law was still in force. The United States had made a start at reorganizing its Army, but at that time it had no armies that could fight a war. However, the United States did possess industrial wealth and war potentiality. In 2 years' time, sufficient armament had been created for entering the war. Before 2 more years had gone by, American matériel had become so well-perfected and abundant that it was far ahead of that of any other country. Although it was not prepared for war at the beginning of hostilities, the United States was so powerful when the war

ended that no further struggle against it was possible. Without doubt, this shows the value of war potentiality. This also shows that it is extremely ill-advised to wait too long before taking precautions. Due to its geographical location, the United States possessed unusual protection against the tanks and other weapons of the Germans. The Atlantic and Pacific Oceans are its antitank ditches. The United States was not ready in 1939. It was not ready in 1941, when it entered the war. It was not wholly prepared until about 1943. And this fact was followed by a number of consequences for the world and for the United States. Europe was invaded and devastated by the Germans because the United States was not ready. The equilibrium of the world was thereby disturbed, and, with peace once again established, the United States had to assume the task of universal reconstruction. In the final analysis, it is its previous unpreparedness that is today costing the United States the dollars of the Marshall Plan.

There is no getting away from the fact that a nation pays in the long run for what it fails to do initially. Although it is unwise to think that war potentiality alone is sufficient, there is one important thing that was brought out by World War II. It is an undeniable advantage for an army to be dismantled entirely, from time to time, in order that it may be built up better later on. This, of course, depends upon whether or not the country possesses sufficient resources. The military profession as well as the civilian population knows this by experience. We are dragging along with us, in our military activities, great quantities of weapons and equipment which are antiquated. The evolution of our Army, like that of our other institutions, takes place slowly. For this reason, there is never any complete reconstruction. Imperceptible changes prevent reforms from being fully effective. It is not possible for France to make great

technical changes. We are not able to carry out an internal revolution, similar to that made by the Americans, even in time of war. We still possess old institutions, such as our Garrison Duty Regulations, which go back to historical times.

It is quite obvious that it would be to France's advantage if we could sweep away the accumulations of the past and make a fresh start based on careful study. But it is very clear that we cannot do this. The United States is capable of almost entirely demobilizing the personnel and equipment of its Army. Then, it proceeds to rebuild. Incomparable efficiency and power are acquired in this way, but it is quite evident that the cost is terrific. It presupposes the ability to reconstruct with extreme rapidity, making use of only a fraction of the industrial capacity of the country for this military reconstruction. And lastly, the country must be isolated long enough for this period of grace to be available.

These are unusual conditions, but they show the great importance of industrial and economic capacity when the burden of a country's military organization is less than the maximum that the country can sustain. When this limit is approached or when the demands of war reach the limit and even exceed the country's peacetime capacity, the country is forced to abandon all its reserve power in order to make this sudden and prolonged effort possible. Obviously, this places France in a position of inferiority. Mobilization, to be most effective, ought to draw on only a relatively small part of the resources of a country—a smaller part than has been considered necessary in the past. It is erroneous to believe that a country, once mobilized, can continue to support a war indefinitely. Total mobilization of all the forces and potentialities of a country, whether they be economic or human, is possible only for a short while.

For a prolonged effort, enormous reserve

power is necessary. This is not a lesson that we learn from the American example only, but one which we learn from the example of the Napoleonic wars. Napoleon understood admirably—and this is doubtless one of the best reasons for his prolonged success—how to manage France's manpower, economy, and finance. This was done to such a degree that the cost of his wars was no burden on French finances, their cost being defrayed by enemy countries. Today, we are still paying for the wars of Louis XIV, but we are paying almost nothing as a result of the wars of Napoleon. It is an illustration of the fact that, if a country is to make a considerable and prolonged effort, a large part of its power must be reserved for subsequent developments, including peace as a subsequent development.

#### Division of Labor

The concept of war potentiality appears today as one of the principal elements of military capacity, in the narrow sense of the word, and of war capacity in a broader sense. This economic capacity is of great importance. Experience showed that war potentiality possesses another aspect that was previously unsuspected. Continuous production—production which is continually stepped up in time of war—appears today to be a condition of defense. For this reason, it is certain that we shall never again see mass mobilization such as Europe saw in 1939 and 1914. The Russian mobilization plans call for mobilizing no more than the youngest of those eligible for service. The human masses will be trained, but they will be left behind in the fields and factories. Thus, a mass of workers far superior to the mass which has been militarized will have been created. This shows the importance of the producing segment of the population in war.

Other problems, also of great importance, are those of monetary distribution and organization. We went into World

War I without any other preparations than the possession of our wealth. We went into World War II without any preparation, having lost a large part of our wealth and not having supplemented this loss by ingenious weapons. It will be necessary, in the future, to study the psychological and material elements that influence the evolution of money. We had gained considerable information in this respect from World War I. The law passed in 1938 attempted to draw a certain number of practical conclusions from this information. The course indicated by the law of 1938 was probably correct. There is no doubt that a war economy must be a directed economy and no other. It is certain that the organizations which were put to work too often showed themselves to be inadequate.

### Industrial Mobilization

I should like to point out an error which existed in the concept which prevailed before World War II as regards industrial mobilization. It was considered that industry could be made the object of a sort of mobilization plan in advance. A war industry map had been made up and a few initial orders had even been handed out. I do not say that the system should be done away with entirely, but it is certain that its inefficiency became apparent in practice. The first thing that had to be done, the day that war was declared, was to throw away all that had been prepared and go to work on something else. This something else was never completed. Thus, for having been too systematic and for having gone too far into detail, instead of taking care of the larger problems, we made an effort which proved to be in vain. It will be necessary to revise this system entirely and take certain important realities into consideration. The first of these is that mobilization is not and cannot be created out of nothing. Mobilization is only the continuation of

peacetime activity for purposes of war. Easy conversion from peace to war no more exists than does natural reconversion from war to peace.

We have had experience along these lines in both directions. We must bear these experiences in mind and review the problem. Likewise, I believe it to be profoundly erroneous to produce war material in our country which does not harmonize with our country's true possibilities. This material constitutes a burden in time of peace which may become extremely heavy. When war comes, it provides only inadequate aid. International coalition may provide a solution by establishing a division of labor.

I am aware that a detailed division of labor implies an infinitely closer engagement with one's allies than is possible under a treaty. A treaty is always difficult to interpret; its wording generally limits its vigor. Division of labor, by directing a country toward certain war products and by excluding others which are to be made elsewhere, binds us together in unshakable solidarity. It gives us a force which France could not aspire to with her resources weakened as they are by recent wars. Her population, territorial expanse, and productiveness are limited in comparison with the immense groups which confront one another today.

### Scientific Research

I believe that there are, therefore, a sufficiently large number of new aspects in the concept of war economy for the military to study profitably. I should like now to mention what is perhaps still more important than war economy—scientific research. This involves the constant discovery of new weapons, new means of waging war, and new methods. Scientific research makes it possible to throw into battle some innovation which, although not necessarily decisive, remains for a long time as a weapon against which there



is no defense. In the last war, scientific research played a leading role. Hitler owed his early victories to German scientific research. His subsequent defeat was due partly to lack of imagination and bad organization of laboratories, although the latter were magnificently equipped. The Germans lost the race in the invention of the atomic bomb. When, in the course of history, men philosophize, they will truly be obliged to say that in reality the bomb was not a decisive element in war. A hundred thousand persons were killed at a single blow, it is true, and this is a frightful thing and one that impresses the imagination. But the number killed in a major campaign is greater than that. There were more deaths in the battle of France than at Hiroshima. In reality, if calm reason had prevailed, the Hiroshima bomb would not have brought about the capitulation of Japan. The bomb did produce a magical effect, however. Men's minds have not been freed of ancient superstitions. The use of paratroops incites fear. During the retreat of May 1940, refugees were frightened more by the sirens of dive-bombers and the roar of motors than by the bombs themselves. As a result, panic was increased and it brought about disorder and defeat.

Scientific research has a role to play. At the right moment, it must introduce some new thing into war. This innovation must not only be efficient and durable, but it must be an extraordinary and extravagant thing which impresses the imagination and clouds the mind of the adversary.

The use of elephants by Hannibal was the result of scientific research. The Romans were more terrified than harmed by them. The research worker carries on an investigation because his mind has been drawn to something which has impressed his imagination. Is it a thing that has any connection with war? Is its efficiency proved? No one knows whether it is or

not. The research worker carries on his work, and it happens that what seems to him most filled with promise results in nothing, and what seemed least filled with promise may have astounding consequences. This being the case, to speak of organization of scientific research is almost a contradiction of terms. Nevertheless, the introduction of this concept of organized scientific research is a thing that belongs to our time. The Germans and the Americans have shown us that only organized collective research could obtain sure results, owing to the operation of the law of large numbers. Is scientific research of this type possible in France? This is one more point with regard to which my opinion has not become established. I believe that France is still a country of scientists, inventors, and research workers, for this corresponds to our national temperament. We are most efficient when not confined to a rigid program. We must organize our research, but we must retain sufficient flexibility. We also must consider the matter of economy which characterizes the management of public affairs.

### War as a Political Act

There is one last point which I wish to call to your attention. Although war possesses its military, economic, and scientific aspects, I believe that it is basically a political act.

I believe it was Clausewitz who said: "We have war only in order that we may have peace." This is true as regards the military conduct of war, and it has become increasingly true with regard to the concept of war itself. The Russians taught us this; the Marxist source of their concepts is evident. Marx had a close friend, Engels, who was often his inspiration. Engels had been an officer in the Prussian Army. He had retained an extremely keen taste for military problems. As a result, he had a tendency to work out the military applications of economic and political

problems and to state them in military terms. The Russians found in Engels' writing—and also, by reflection, in those of Marx—a sort of military instruction derived from Prussian teachings with the beginnings of an adaptation to socialistic revolutionary ideas. Certain Russian communists immediately took up these military studies with great enthusiasm. When Lenin was in Switzerland at the beginning of the twentieth century, he studied military problems in the books which he had at his disposal. He attempted to evolve a certain number of new ideas, adapting the following military aims and characteristics to social revolution:

1. The military reinforcement of social revolutions.
2. Ideological penetration.
3. Prelude to conflicts.
4. Presence of the enemy without visible forces or armament.

It is possible that the war of tomorrow will be exclusively a political act. It is very probable, in any case, that the fundamental phases of the war will be political, and that the armed forces will be employed only at the last moment. This does not mean that they will not play a large role,

for that is another aspect of the political war.

### Conclusion

War, in its preliminary phase, is a sort of fiduciary struggle. The divisions are carried on the books, so to speak. We establish the geographic position of our forces. We list possible allies. From time to time, we strike a balance without any exchange of money or without any movement of military forces. This sort of fiduciary warfare is what we are in the midst of at the present time. We wage it every day. At the present time, military potential plays a role that is probably more effective than it would be on a field of battle, and the hazards are just as great. I believe that this aspect of military potential also requires attention.

I have, therefore, attempted to review for you certain of the new aspects of our problems. I am not bringing you any doctrine. I am proposing that you do the research and reflection. That is the way instruction is to be understood and doubtless, that is the way life is to be understood. We solve nothing, but we keep presenting new problems. The solutions which we find only help us, in reality, to present other new problems.

---

The recent war demonstrated that our greatest weapon is not our peacetime Army, Navy and Air Force, so much as our industrial potential.

*Admiral Louis Denfeld*

## The Battle of Caen

Digested by the MILITARY REVIEW from the official Canadian booklet, "Canada's Battle in Normandy," \* by Colonel C. P. Stacey, 1946.

... The area that we had, that was most valuable to him, was Caen; every foot of ground he lost at Caen was like losing 10 miles anywhere else. . . . I hope some of you people have gone down through the Falaise Gap. . . . Every piece of dust there was worth more than a diamond to him.

*General Eisenhower, 31 August 1944.*

WHEN the Allies had established their first bridgehead in Normandy and made it moderately secure, two immediate necessities confronted them. One was the capture of Cherbourg. The other was building up their forces on the Continent to the point where they could take the offensive at an early date with the object of destroying the German armies and liberating the whole of Western Europe.

The taking of Cherbourg was the business of the Americans, and they set about it in a very workmanlike manner. They took Cherbourg on 26 June, and the whole upper part of the peninsula was completely cleared by 1 July. In the meantime, the American forces farther south had also moved forward and were within striking distance of St. Lô.

These triumphs owed much to hard fighting by the British Second Army. Although progress had been halted for the moment in the region immediately about Caen, the lodgement area was somewhat extended as the result of the determined efforts of General Dempsey's men south and southeast of Bayeux. Here in the last week of June, a bridgehead established across the River Odon, a tributary of the Orne, seemed to offer the hope of "pinching out" Caen by an enveloping movement. Against this threat, the enemy concentrated a tremendous mass of his very best troops. Four additional SS *Panzer* divisions, constituting Field Marshal Rommel's main reserve, appeared in succession: the 2nd (*Das Reich*), the 1st (*Leibstandarte Adolf*

*Hitler*), the 9th (*Hohenstaufen*) and the 10th (*Frundsberg*). The last two had been hastily brought from the Russian front. Never before had so many SS formations been seen in so small an area. Add the 2nd *Panzer* and the *Panzer Lehr* Divisions, and remembering the 12th SS and the 21st, it will be seen that the enemy had no fewer than eight armored divisions on the Anglo-Canadian front between Caumont and Caen. On 30 June, in a directive to his British and American Army Commanders, General Montgomery wrote: "My broad policy, once we had secured a firm lodgement area, has always been to draw the main enemy forces in to the battle on our eastern flank, and to fight them there, so that our affairs on the western flank could proceed the easier." The policy succeeded; but it meant some very hard sledding for the British and Canadians.

### Building Up the Invasion

The Allied "build-up" had made fair progress. By 29 June, the bridgehead contained a total of 12 British and Canadian divisions (plus several independent brigades) and 13 American divisions.

The violent resistance encountered around Caen, and the cramped state of the bridgehead in this area, combined with the fact that the general progress of operations had been somewhat slower than had been expected, resulted in the movement of Canadian formations to France being considerably set back. General H. D. G. Crerar, Commander of the First Canadian Army, crossed to Normandy on 18 June. His small Tactical Headquarters was set up in Amblie, east of Creully. It was to remain there, as things turned out, for more than 2 months. Although Main and Rear Headquarters were to open at Amblie

\* Printed by the King's Printer, Ottawa, Canada, 1946, price 50 cents.

at midnight on the night of 19-20 June, and theoretically did so open, the gale and still more the situation in France postponed the move, and that part of Army Headquarters which had been sitting in its marshalling area waiting to embark for Normandy retraced its steps and opened again at Headley Court near Leatherhead. Not until 24 July did the first "shift" of Main Headquarters actually reach Amblie. During the intervening period, General Crerar was temporarily, in effect, a General without an Army. In the painfully crowded area north and northwest of Caen, the dusty roads were already incredibly congested, and there was simply no room for another body of Army Troops. Towards the end of June, however, it was decided to bring over the 2nd Canadian Infantry Division and the Headquarters of the 2nd Canadian Corps; and Main and Rear Corps Headquarters set up at Camilly, south of Amblie, on 6 July. On 7 July, the main body of the 2nd Canadian Division, commanded by Major General (later Lieutenant General) C. Foulkes, likewise crossed the Channel.

### Back to the Offensive

The front of the 1st British Corps, under which the 3rd Canadian Division was still serving, was relatively quiet during the latter part of June. Not until 4 July were the Canadians again launched in the direction of Caen.

The immediate object of this new operation, known by the code name *Windsor*, was the capture of Carpiquet. The 8th Canadian Infantry Brigade, plus the Royal Winnipeg Rifles, was charged with carrying it out. The Brigade was supported by the tanks of the Fort Garry's, by "Flail" tanks (for detonating mine fields), by "Crocodiles" (flame-thrower tanks) and by AVsRE (special assault vehicles). A tremendous weight of artillery, including the 16-inch guns of HMS *Rodney*, prepared the way for the attack.

The enemy, mainly drawn from units of the 12th SS *Panzer* Division, fought with fanatical zeal, but he could not keep the Canadians out of Carpiquet. By 0700, the Chaudière and the North Shore Regiment had broken through his positions and were consolidated in the village. The Winnipeggers reached the hangars at the south side of the Carpiquet airfield, but were driven out of them when troops on their right could not hold the village of Verson. The airfield as a whole, in consequence, remained in enemy hands for 5 more days; and the 8th Brigade, in its exposed and all-but-isolated position on the high ground at Carpiquet, was subjected to heavy artillery fire and frequent counterattacks by infantry and tanks.

The first stage in the offensive against Caen had achieved a respectable measure of success in the face of bitter opposition. It was now practicable to assail Caen itself.

At 0430 on 8 July, the 1st British Corps launched Operation *Charnwood* with three divisions (the 3rd Canadian, the 3rd British and the 59th) and three armored brigades, of which the 2nd Canadian was one. As a prelude to the attack, the RAF Bomber Command intervened in the battle, delivering a shattering attack against troops, armor, and strongpoints in and about the city of Caen. The enterprise was further supported by massed land artillery and by the guns of the fleet, whose constant assistance throughout the bridgehead campaign had been of incalculable value. The 3rd Canadian Division was on the right wing, and, in the first phase, the 9th Brigade had the satisfaction of driving the stubborn enemy from the villages of Buron and Authie where it had sustained such a stiff reverse a month before. Thereafter, the 7th Brigade took over the advance and drove in to clear the country between Authie and Caen. By evening, the Canadians were on the western outskirts of the city, and a squadron of the 7th Canadian Reconnaissance Regiment (17th Duke of

York's Royal Canadian Hussars) penetrated into the middle of it in the hope—which proved illusory—of seizing one of the Orne bridges intact. On the 9th, the Stormont, Dundas, and Glengarry Highlanders advanced into Caen, encountering comparatively little resistance. In the course of the following day, the whole of the city north of the Orne was securely in our hands. To the west, the 8th Brigade had in the meantime secured the remainder of its objectives at Carpiquet.

There was now a brief pause, while the British forces regrouped for the leap across the Orne and the further extension of the bridgehead. During this interval, on 11 July, Lieutenant General G. G. Simonds' 2nd Canadian Corps took over a section of the front and with it the 3rd Canadian Division and the 2nd Canadian Armored Brigade. The 2nd Canadian Division it had already had under command. This formation, which had not been in action since Dieppe, entered the line west of Caen on the night of 11-12 July.

Caen, when our troops entered it, was a tragic city. This community of 54,000 people had suffered terribly from the air bombardment. Although the destruction had not been quite universal, whole quarters of the place had been reduced to rubble and twisted wreckage by the RAF "block-busters." Yet the spirit of its people was unbroken, and they nursed no grievance against the British forces for these wounds inflicted in the process of liberation. Here for the first time our troops met Frenchmen who welcomed them warmly and unquestioningly. Here for the first time, too, we made definite contact with the gallant spirits of the resistance.

### The First Breakout from Caen

While the Canadian Corps prepared to break out from Caen across the Orne, British forces farther west, above the city, were developing heavy attacks in the direction of Evrecy, which had the very useful

effect of attracting German reserves to this area. Then the main attack (Operation *Goodwood*, the Canadian part of which was known as *Atlantic*) went in on the morning of 18 July, following the greatest air bombardment yet attempted in the theater. British and American aircraft dropped more than 7,000 tons of bombs on enemy targets in the eastern section of the Caen area. The 8th British Corps, composed of three armored divisions, had crossed the Orne lower down, where, thanks to the airborne troops, both its



banks had been in our hands from the beginning. The armor now lunged southward, hoping for a breakthrough. In the first instance things went well; but on the edge of the higher ground about Bourguebus, some 4 miles southeast of Caen, and on the plain to the east, a formidable screen of antitank guns put an abrupt period to the advance.

On the same day, the 8th and 9th Brigades of the 3rd Canadian Division had also crossed the Orne below Caen and at-

tacked southward. Bitter resistance around the chateau at Colombelles imposed temporary delay, but it was overcome. In the meantime, the 7th Brigade had broken across the Orne from Caen itself, captured the southern suburb called Faubourg de Vaucelles, and held it. Later, on 18 July, the 2nd Canadian Division, which had been held in readiness for exploitation, moved through Vaucelles and advanced south. In the course of the day's operations, the commander of the 4th Canadian Infantry Brigade was wounded and had to relinquish command. During the next 2 days, the Division continued to push on in the face of stiffening resistance. A foothold was gained on the high ground, but lost again. It became clear that the enemy had succeeded in checking the momentum of our offensive and again stabilizing the situation. Much had been gained, nevertheless. Whereas on 4 July, the enemy had held Caen securely, with the town covered by a semicircle of territory in his hands to the north and west, the circumstances were now reversed. Caen was ours, and with it a semicircle of country covering it to a distance of 4 miles or so to the south and east. Strong enemy positions still contained our bridgehead in this all-important area. The bridgehead had been very materially extended by the operations of the past fortnight, and there was now elbow room sufficient to permit bringing in from England the additional armored divisions and other troops required for the full-scale breakout.

The period of hard slogging in the Caen area was not yet over. For weeks past, the Anglo-Canadian forces had been delivering, in effect, a great, continuous and costly "holding attack," designed to draw to their front every possible German division and thus facilitate the operations of the Americans on the other flank. Those operations had now reached the point where it was possible to launch the offensive contemplated in the Allied plan from

an early date—the break-through in the west that was designed to lead to the encirclement and destruction of the whole enemy field army in Normandy. This was the more practicable in that Operation *Goodwood* had led the Germans hastily to withdraw two armored divisions from their central sector eastward across the Orne. There were now no less than five of them east of the river. On 21 July, General Montgomery ordered the First United States Army to strike its great blow. The same directive ordered the Second British Army to operate intensively with a view to inducing the enemy to build up his main strength east of the Orne "so that our affairs on the western flank can proceed with greater speed." And it fell to the 2nd Canadian Corps to deliver the final phase of the long British holding attack—the phase coinciding with the great American blow in the west.

The Canadian attack (Operation *Spring*) was directed southwards along Route Nationale No. 158—that highway, running straight as a rifle barrel across the country between Caen and Falaise, which will ever be famous in the history of Canadian arms. The plan involved the use of two Canadian infantry divisions—the 2nd on the right and the 3rd on the left. A great force of artillery was provided and heavy harassing fire was directed against enemy positions from the evening of 23 July onwards. Medium bombers also took part in the preparation.

At 0330 on 25 July, the infantry moved forward against the commanding enemy positions in and about the little villages on the rising ground on either side of the road to Falaise. The 3rd Division, east of the road, assailed Tilly-la-Campagne and its vicinity. The 2nd moved against May-sur-Orne and the neighboring hamlets west of the road. An innovation, "artificial moonlight" from searchlights directed at a low angle, was used to light the way for our troops and, it was hoped, to blind the

Ca  
of  
9 J  
att





Caen was a vital center in the Allied breakout from the Normandy bridgehead. Above, men of the 3rd Canadian Infantry Division advance across a grain field northwest of Caen on 9 July 1944, the day the city fell. Below, medium artillery supports a Canadian infantry attack during Operation "Spring" south of Caen on 25 July 1944.—Canadian Army photos.



enemy. On both flanks, there was some progress in the first instance. By 0900 the North Nova Scotia Highlanders were in Tilly-la-Campagne. The Germans, however, were determined not to loose their hold on the area; their infantry and tanks, supported by artillery and mortars, put in a succession of violent counterattacks; the Highlanders were thrown back on to the defensive, and by the 26th had been obliged to give up their foothold in the village.

On the front of the 2nd Division, the result had been similar. Here, the Germans held particularly strong ground, and old mineshafts and tunnels gave special advantages to the defense. Enemy guns and mortars, powerfully seconded by tanks dug in on commanding positions from which the enemy had perfect observation, cut the attacking battalions to pieces. "The enemy used his weapons cunningly; 88-mm's had the roads covered, dropped concentrations on orchards and fields, and then, at intervals, searched all areas systematically. His fire was so carefully planned that every position we were likely to move to, or to wait in, had fire raining down on it." The wheat fields gave excellent cover to the enemy's machine guns and snipers; and all his weapons were extraordinarily difficult to locate.

The 4th Canadian Infantry Brigade, attacking on the left, got the Royal Hamilton Light Infantry into Verrières, and kept them there. But the Royal Regiment of Canada, trying to drive on to Roquancourt, met with failure. On the right, the 5th Brigade had still worse luck. The Calgary Highlanders, in the first phase, got a foothold in May-sur-Orne but were pushed out again. In the second phase, the Black Watch (Royal Highland Regiment) of Canada, attacking most gallantly across the ridge east of May in an attempt to capture Fontenay-le-Marmion, came under a hurricane of converging fire. Only a very few men out of the 300 or so who comprised the four rifle companies committed to this

attack succeeded in returning to our lines.

When the operation ended, we had lost much of the ground gained in the beginning and many infantry units were sadly depleted. Yet the sacrifices made had purchased important advantages. We still held Verrières; and this village was a tactical position of great consequence. It stands on the north end of the same ridge the Black Watch had assailed, the highest point in the enemy's old forward line. We had now greatly reduced the Germans' observation and materially improved our own; and we had a foothold in the outworks of their line which would go far to facilitate future operations. This was not all. The Canadian attacks had pinned to their ground south of Caen a great concentration of Field Marshal von Kluge's best divisions at a time when they were urgently needed elsewhere. On the far western end of the front, out beyond St. Lô, the Americans, on this same 25th of July, had launched the attack initiating the immense concerted operation that was to result in one of the greatest victories of modern times.

### Canadian Army Takes Over

By this time, General Crerar's Canadian Army Headquarters had already taken over a section of the front. It was indicative of the manner in which the resources of the 21st Army Group were to be shared out between its two Army Headquarters that the first fighting formations to serve under him in the field should be not Canadian, but British. The bridgehead was now large enough to afford room for the Canadian Army Troops. Arrangements were made accordingly. At noon on 23 July, Headquarters First Canadian Army took over the 1st British Corps from General Dempsey and became responsible for a front of roughly a dozen miles running inward from the coast. The Canadian Army Commander thus assumed control of the extreme leftward sector of the Allied

line—which he never afterwards relinquished.

In this sector, the British forces were in the main committed to a holding role. General Montgomery, however, desired that this left flank should now push forward with a view to facilitating the use by the Allies of the inland port of Caen. Planning for this limited operation was actively carried on, but finally it was shelved in favor of a much greater enterprise.

The first battle of the First Canadian Army was to be no minor affair. The assumption of a very active role by General Crerar's Army was foreshadowed by an extension of its front on 31 July. At noon on that day, the 2nd Canadian Corps in the Caen sector passed under its command, and the Army Commander was now responsible for a 20-mile front extending from the banks of the River Orne 4 miles south of Caen around to the Channel coast east of the mouth of that river.

From D-day until 11 July, the 3rd Canadian Division had fought under the command of a British Corps. From the time when it arrived in France until 31 July,

the 2nd Canadian Corps had been under the Second British Army. Now, for the first time, the Canadian formations in the theater were concentrated under their own higher command—which was itself, of course, subject to the superior authority of the 21st Army Group and of Supreme Headquarters, Allied Expeditionary Force. A word must be said of the remarkably smooth and effective cooperation which had existed between the staffs of the Canadian formations and the various British headquarters with which and under which they fought.

The Army Commander now had the satisfaction of at last having under his command in France virtually the whole of the Canadian field army apart from the formations engaged in Italy. The 4th Canadian Armored Division, commanded by Major General G. Kitching, had arrived from England late in July. At the end of the month, it took over the 3rd Canadian Division's sector of the front, and that much-tried and gallant formation was withdrawn from the line, along with the 2nd Canadian Armored Brigade, for its first real rest since D-day.

---

The ground force soldier who is able to make use of sea or air transportation for reaching his combat sector, and who is then able to live, fight, and maintain himself for weeks and months in any kind of weather, is more than ever the keystone of the military effort. Nevertheless, every soldier must understand that at the present time he is but one of a team.

*Field Marshal Montgomery*

## The Defense of Scandinavia

Digested by the MILITARY REVIEW from an article by Colonel E. H. Wyndham in "The Army Quarterly" (Great Britain) April 1949.

DURING the last few months, the defense preoccupations of the Scandinavian countries have been much in the public eye.

First of all, we need to have in mind a clear picture of the importance of Scandinavia from the point of view of strategic geography. Geographically, the area comprises two peninsulas enclosing the Baltic, one large island on the northern fringe of the Atlantic, and another in the Arctic Ocean. Both peninsulas and islands are remote from the center of Europe. This fact has given the two peninsulas immunity from becoming involved in many past conflicts. It is really only within the last 10 years that the immense increase in the range of weapons of war has brought the two islands into the strategic picture at all. No part of Scandinavia can ever be the scene of a major conflict on land. The ground is unsuitable and the necessary communications are lacking. Its importance lies in the possibilities which it affords for bases for the development of warfare on, under, and over the surface of the sea.

This fundamental fact of strategic geography leads to the following obvious conclusions:

1. Whoever holds the Danish and Swedish-Norwegian peninsulas can:

a. Seal the entrance to the Baltic.

b. Deny the passage of the Baltic to all but coastal traffic along its eastern and southern shores.

c. Seriously interfere with the passage of the North Sea.

d. Threaten the British Isles with air or rocket attack. The Faroe Islands are also important for this purpose.

2. Whoever holds Iceland can seriously interfere with the passage of the North Atlantic.

3. It is likely that in any future world war the Arctic regions will be the scene of an airborne campaign, and in that case Spitsbergen becomes of importance.

It is clear that, in view of the present distribution of power in the world, these geographical facts give to Scandinavia a degree of strategic importance far in excess of any that she possessed in the past. It is small wonder that three of the countries concerned have lately indulged in much anxious thought as to the best policy to adopt and that their deliberations have been watched with interest and anxiety on both sides of the Atlantic. The fourth Scandinavian country, Iceland, in her remote position, has taken little part in these discussions.

Having dealt with geography, we must now turn to history. The roots of the policy of a country in the present are usually planted in the soil of the past, and the Scandinavian nations provide a very clear example of this fact. Starting with the reign of Gustavus Adolphus at the beginning of the seventeenth century, Sweden engaged in considerable military activity on the Continent of Europe during 2 centuries. This activity was no doubt stimulated by the fact that in those days she possessed Finland, Esthonia, and parts of what is now Germany. She was thus a Central European as well as a Scandinavian power. At the end of these centuries of Continental warfare, she found herself bereft of Finland and of her possessions on the east side of the Baltic, and confined to her share of the larger of the two Scandinavian peninsulas. Her people may well have said to themselves: "The conclusion to be drawn from the experience of centuries is that war returns a loss instead of a profit." There followed, for

Sweden, a century of undisturbed peace. Then came two world wars in which she managed to remain neutral. Can we wonder that she is slow to grasp the full implications of totalitarian warfare which now face the world?

Norway, consisting of a long, narrow strip on the northern flank of a peninsula largely isolated from the mainland of the Continent, has had, until the present century, little reason to fear aggression. She escaped World War I, but had a very rude awakening in World War II. We therefore see her today moving rapidly away from the attitude still maintained by Sweden, which she shared until 1940.

Denmark had a nasty experience of war in 1864, but after that had little reason to fear aggression. Her immunity during World War I even led her to contemplate the abolition of her armed forces during the interwar period. When she succumbed in 1940, she probably suffered less under the Germans than any other Nazi-occupied country. She therefore today seems to hover between the opposite ideas of Norway and Sweden.

Iceland has no military history and would seem to have no part to play in war except to be occupied by one side or the other in any conflict in which the passage of the North Atlantic is of vital importance. Her people may well regret this liability, but they seem to be conscious of it and resigned to it.

With this background in mind, we may briefly glance at the defense deliberations of the Scandinavian countries during recent months. On 8 September 1948, the foreign ministers of the four countries met in Stockholm. They decided first of all to collaborate closely in the United Nations General Assembly. Secondly, Iceland abstaining, they affirmed that because of their different strategical positions, problems of military security were considered somewhat differently in the three countries. They felt, however, that there was common

ground for military collaboration and recommended the appointment of a special committee to study this question.

It will be noted that the least experienced country, Iceland, refrained from committing herself, while the others agreed to differ in advance. For the next 4 months, the special committee deliberated, concluding its work on 14 January. Four days later, the Swedish Prime Minister announced that his government was prepared to consider a Scandinavian defense union to remain outside the great blocs of the world and to aim at neutrality in the event of war. There would, however, be an obligation to go to war if either of the two other Scandinavian countries were attacked.

This, in effect, was a roundabout method of announcing that only if she herself was attacked would Sweden go to war. Supposing such an undertaking had been in force in 1940, would Sweden have come to the support of Norway or would she have accepted Hitler's statement that he was occupying Denmark and Norway to protect them from a British attack?

In this same statement, the Swedish Prime Minister admitted that in Norway and Denmark there was a considerable body of opinion in favor of joining the Atlantic Pact, though many people in Denmark shared the Swedish point of view. With the exception of the communists, the other political parties in Sweden also supported the idea of a Scandinavian alliance.

Between 21 and 24 January, the prime ministers, defense ministers, and members of Parliament of Norway, Sweden, and Denmark met in Copenhagen. They reached agreement on the following points: 1. The need to continue economic sacrifices. 2. The "possibility in certain circumstances of reaching a mutually binding but otherwise unattached Scandinavian defense union as a regional security agreement within the framework of the United Nations." 3. The necessity of knowing

whether the countries taking part in the union would be assured of priority and "reasonable economic conditions" in obtaining the requisite defense material from the outside world. Finally, it was announced that divergencies of opinion on the conditions and consequences of the alliance would be discussed at a further meeting in Oslo on 29 January. Needless to say, this second attempt to reach agreement failed because, as the Norwegian Prime Minister said, the three countries assessed their security problems differently.

It will be noted that throughout these abortive deliberations each country ran true to the form imposed by the experi-

ences of the past. Sweden clings pathetically to the hope that her luck will hold a third time. Norway is determined not to be caught again without a definite and inescapable guarantee of support from someone. Denmark, with her rather negative experiences, cannot make up her mind. Iceland, lacking experience, is content to wait and see. Since her neighbors thus have nothing to offer her but an uncomfortable and insecure seat alongside them on the fence, Norway finally vaults off it into the Atlantic Pact. The final deciding factor no doubt was the determination of the United States not to provide arms for any group outside this Pact.

## Australia's Long-Range Weapons Organization

Digested by the MILITARY REVIEW from an article by Lieutenant Colonel S. A. Morrison in the "Australian Army Journal" (Australia) February-March 1949.

### Historical Background

DURING World War II, it became evident, especially to Germany, that some radical change to the accepted methods of anti-aircraft defense and long-range bombardment had to be brought about to compete with the Allied Air superiority and the increased performance of modern aircraft. The anti-aircraft gun for high-altitude shooting was rapidly becoming obsolete, and large numbers of shells were being expended in order to shoot down a single aircraft.

In an effort to overcome this problem, rendered extremely acute by the highly successful Allied bomber offensive, Germany turned a large proportion of her scientific effort to the production of high-speed pilotless-guided anti-aircraft and ground bombardment weapons. In this work, the German scientists were greatly assisted by a considerable amount of knowledge already available on rocket propulsion, a great deal of research hav-

ing been carried on in this field prior to the war.

As a result of the enormous scientific and industrial effort devoted to this work, several types of subsonic and supersonic weapons appeared in service, the best known examples being the V-1, the V-2, and the *Henschel* powered glider bombs, the HS 293 and 294 series. In addition to these offensive weapons, several types of defensive anti-aircraft weapons were also under development, though none were completed in time to appear in service.

This work continued under high pressure until the end of the war, but due to the immense amount of damage caused to Germany's industrial areas and research establishments by Allied bombing, relatively little production was achieved. A considerable amount of fundamental research was carried out, however, and a mass of valuable data was accumulated.

Towards the end of the war, it was agreed that in spite of complete Allied air superiority, some effort should be devoted



to research and development work on guided weapons, so that Britain should not lag behind in this new and very important field of defense. As a result, work was begun in the Ministry of Supply late in 1944.

It immediately became evident that the production of a reliable and efficient guided weapon called for an enormous expenditure of money and a correspondingly large effort in terms of manpower. At this time, very little was known either in Britain or America of the problems associated with controlling guided weapons flying at speeds greater than the speed of sound. Practically no work had been done on liquid-fuelled rocket motors or ram jets necessary to obtain the required performance.

This position was improved somewhat when Germany surrendered, since access was then possible to the vast fund of knowledge which had been built up by Germany during the war. However, it was still evident that a long, expensive, and arduous task lay ahead before it would be possible to have a reliable guided weapon in the hands of the services.

In addition to the many scientific problems presented in the actual production of the weapon and its associated equipment, a purely practical problem was presented by the lack of a suitable trial ground within the British Isles. The only available ranges designed for gunnery, bombing, and unguided rocket trials, involved firing over the sea for strictly limited distances, rendering recovery impossible and seriously limiting observational facilities.

To overcome this problem, the possibilities of other countries in the Empire were assessed with a view to finding a suitable area for constructing a long range over land, with a future extension over the sea, to give a total range length of about 3,000 miles. The only Dominions which showed any promise as a result of this assessment were Canada and Australia, the former

having a big advantage in being relatively close to the United Kingdom, but a big disadvantage due to climatic conditions. Firing in Canada would inevitably have to take place over deep snow in winter, rendering observation hazardous and recovery extremely difficult, if not impossible.

The proposed area in Australia (MILITARY REVIEW, December 1948, p. 64) was first surveyed by a joint United Kingdom-Australian party in the winter of 1946. At that time, it was intended to locate the rangehead at Mount Eba, but later it was decided to move back to Woomera so as to reduce the distance from Adelaide and increase the length of the range.

A report was made to the United King-



dom Ministry of Supply on the possibilities of the area, and negotiations were commenced between the United Kingdom and Australian governments early in 1946. At the same time, work was begun in various Ministry of Supply establishments, planning the technical aspect of the proposed range, assessing the requirements, and estimating the cost of the project.

The proposed range was to run from Woomera across the desert for a distance of about 1,200 miles, with the possibility of a future extension of about 1,500 miles across the Indian Ocean towards Christmas Island. The advantages of the area are immediately apparent. It is virtually uninhabited, so that little, if any, risk

would be incurred. The climate, though very hot during the summer months, is good during the remainder of the year. The visibility, with the exception of ground heat haze, is good. Recovery of expended missiles presents no insuperable problem, and the setting out of observational facilities and general range instrumentation are relatively simple.

The disadvantages of the area are, in the main, those which would inevitably be associated with the setting up of any large project in a virtually uninhabited desert region. These are broadly covered by lack of water, poor communications, and general absence of essential facilities. But none of these problems is insuperable, and all are being dealt with as described elsewhere.

The Department of Munitions—now Department of Supply and Development—was charged with the responsibility of setting up the organization necessary to conduct all aspects of long-range weapons research, development, and trials in Australia. Early in 1947, a party of engineers and scientists from the United Kingdom Ministry of Supply arrived in Australia to take part in this work, and the Long-Range Weapons Organization, a joint United Kingdom-Australian enterprise was formed.

### Organization

The Long-Range Weapons Establishment (LRWE) in South Australia consists of three components, geographically separated, each under a superintendent, but all working in a single entity under the chief superintendent.

The headquarters of the chief superintendent is at Salisbury. Its primary purpose is to undertake all research and development work connected with experimental trials and with the equipment used on the range. It is also responsible for the coordination and provision of all technical equipment and information required for

the construction of the range. As facilities at Salisbury grow, it is intended that more and more defense research and development will be undertaken, until this work eventually becomes the primary interest of the establishment.

### Staff

The recruitment of a scientific and engineering staff for the establishment is being carried out in two ways:

1. Direct Recruitment. By this method, qualified technical staff are recruited by the Department of Supply and Development in Australia and in the United Kingdom for immediate employment at the establishment.

2. Trainee Recruitment. In order to build up the nucleus of a trained scientific staff with a knowledge of guided weapons work, numbers of young scientists and engineers are being recruited. After a short period at the establishment, they are sent to the United Kingdom for training. The period in the United Kingdom will normally be about 2 years. During this time, they will be employed by Ministry of Supply research establishments engaged in guided-weapon work. On completion of this training period, they will return to Australia and take up appointments in the Long-Range Weapons Organization for a period of at least 3 years.

### Air Component

At present, the air establishment is located at Mallala and is staffed by Royal Australian Air Force personnel. Later, it is hoped to move this establishment nearer to Salisbury. The responsibilities of the air component are the provision of all air facilities necessary for experimental flying, transportation of stores and personnel, and air reconnaissance.

### Range

The range establishment, located at Woomera, is being planned to provide all

services and facilities necessary to carry out large-scale experiments as required by the chief superintendent. The majority of these services and facilities will be manned by personnel from the three fighting services, while the more special scientific measurements and the conduct of experiments will be in the hands of civilian scientists.

### Facilities at Woomera

In order to house the operational staff and their families at Woomera, a village is being constructed about 4 miles from the main technical establishment. This village will eventually be of permanent construction and will be designed to provide all possible amenities so as to reduce to a minimum the hardships of living 120 miles from a main center.

As a temporary measure, water is being pumped from Lake Arcoona. The main water supply will eventually be obtained by means of a 10-inch main from the Morgan-Whyalla pipe line at Port Augusta. Work on this supply has commenced and should be completed in about 5 months.

An airfield is being provided with three runways, one 2.5 miles long, and two 2 miles long. Hangar accommodation and all facilities for both experimental work and aircraft servicing will be provided.

One large laboratory block will be constructed to accommodate the scientific staff working in the range area. The laboratory block will be designed to provide all the necessary facilities for project work, photography, maintenance of electronic equipment, and chemistry. The building will be constructed of permanent materials and will be fully air conditioned.

A workshop will be provided for the maintenance and manufacture of equipment for the ranges. Work beyond the capacity of this workshop will be done at the establishment at Salisbury.

A transport section will be provided to

maintain the transport required for use on the ranges.

In addition to the facilities outlined above, technical stores, canteen, administrative headquarters, fuel stores, and magazines will be provided.

### Range Instrumentation

In view of the immense cost and effort that goes into the making of a single experimental projectile, considerable care must be taken to ensure that the maximum amount of information is obtained from every firing.

The type of information required will vary from missile to missile since each firing is a scientific experiment designed to obtain valuable data on some aspect of scientific interest.

Thus, a trial might be run to get data on longitudinal accelerations, lateral acceleration, angles of pitch and yaw, and information on roll. Another trial might demand information solely concerned with the means of propulsion, such as temperatures, pressures, or time of burning.

To meet these varying requirements, a very elaborate system of range instrumentation must be built up.

### Electronic Methods

To obtain the position of the missile at any given instant, straight radar tracking can be used. This operates in exactly the same way as a radar set tracking an aircraft. A pulse transmitted from the set is reflected back from the missile and picked up in a receiver. The direction of the missile is thus obtained, and its distance from the set is given by the time taken for the pulse to complete the "journey out and back." From this information, the elevation and bearing of the missile are established, giving its position in space at any given instant.

By carrying a telemetry set in the projectile, information as to what is happening inside the missile itself can be

transmitted to the ground and picked up on a special receiver. By this method, information on accelerations, roll, pitch and yaw, pressures and temperatures inside the missile can be obtained during flight.

### Optical Methods

Several optical methods of instrumentation are used, the main ones being:

1. High-Speed Photography. By means of a high-speed movie camera, with a time base photographed on the film, it is possible to follow the missile during the early stages of its flight and obtain useful data on altitude and velocity.

2. Acceleration Cameras. Acceleration cameras, operated by remote control and located to a flank, take a series of photographs of the missile at fixed time intervals during the acceleration period. These photographs can then be interpreted

to obtain the axial accelerations during the early part of the trajectory.

3. Kine Theodolites. The kine theodolite is virtually a theodolite operating with a camera, the theodolite readings being photographed together with the missile in flight. By using two or more of these instruments located at known positions, it is possible to compute the position of the missile and its velocity at any given instant.

### Terrain

The country around Woomera is very sparsely populated. It is a wool producing area with a carrying capacity of about 20 sheep to the square mile. Although the rainfall never exceeds 10 inches a year, water is obtainable from artesian wells.

Much of the country over which the missiles will be fired is uninhabited, so the operation of the establishment will cause little inconvenience to anyone.

## Morale as the Basis of Modern Strategy

Digested by the MILITARY REVIEW from an article by Group Captain A. H. Stradling in "The Royal Air Force Quarterly" (Great Britain) October 1948.

WE ARE witnessing, in these anxious days of move and countermove between the Western Powers and Russia, a repetition of what in 1939 we termed "the new war strategy." World War I was the last of the old style wars. For World War II, Germany introduced a new technique. In order to draw comparisons between what is taking place today and what took place prior to the outbreak of the last war, it is necessary to go back to the defeat of that nation in 1918 and what followed. By doing so, we can trace the birth of the "new idea" back to this earlier period.

### Defeat of Germany in 1918

From 1916, communistic propaganda had eaten into the souls of a people whose

minds and bodies were already weakened by privation due to the British blockade. Physically and psychologically they continued to weaken, and by 1918 they were physical wrecks. Mentally, their morale had been destroyed. Ideals were shattered, their confidence gone. They could no longer persevere. Unable to stand further reverses, they sought an armistice and finally accepted the harsh terms of the Treaty of Versailles.

Defeat came to this nation at a time when her powerful armies were still in being. In comparison with 1945, her armies were undefeated. Here we see the germ of the idea of "the new war strategy." Let us examine what followed.

The spirit of militarism remained in a

proud remnant of the German Army. They vowed that they would reinstate Germany in her former position, and that never again would they allow defeat to be brought about by the undermining of the nation's morale. From 1918 onwards, they never ceased to instill into their young people the fact that the Army remained undefeated. They made it clear that the civilian population let them down, and how this was brought about by the undermining of the nation's morale.

The *Stahlhelm*, akin to our British Legion, Comrades of the RAF, and like organizations, took up the cause. They inaugurated the Junior *Stahlhelm*. This they carefully and diligently "nursed" and "fed" with pride and success in the "invincible tradition" and the vital importance of morale of civilians as well as of the armed forces. Here was the beginning of "total warfare," which no longer embraces the armed forces alone but the whole nation.

When the Nazis seized power, they took over these organizations as the nucleus of the new army, to be developed with the rest of the nation and thoroughly "drilled" according to the new idea of war.

### The New War Strategy

What is the new war strategy? It decrees that war is a "totalitarian" business, embracing in the most direct way the civilian population even more than the armed forces.

The new extended strategy was founded on a psychological basis which emphasized the all-important factor, morale.

War was analyzed and planned into four phases:

- |                      |                                   |
|----------------------|-----------------------------------|
| 1. Propaganda        | } Three-quarters attacking morale |
| 2. Diplomacy         |                                   |
| 3. Economic pressure |                                   |
| 4. Military pressure |                                   |

It was held and practiced that "policy" should no longer be determined by the professional opinion of the military authori-

ties. Further, since military pressure was but one of the four phases, and the last one, it would be used only if necessary, and only after the other three had prepared the way.

Military pressure was to be used only when the morale of the intended victim had been destroyed or sufficiently weakened to make the minimum of military pressure necessary.

We have not far to seek when looking back for examples of the success of this new war strategy.

In Austria and Slovakia, morale was almost completely destroyed and little or no military pressure was needed.

With Poland and Greece, the morale of the people remained higher. Military pressure was necessary.

We witnessed in 1940, to our utter amazement, the sudden collapse of a great nation, our ally France. Her navy was intact, her air force still formidable, and a large part of her army was still capable of continued resistance.

By insidious propaganda, France's confidence was slowly but surely undermined until at length her morale was insufficient to withstand the continued reverses. Despite a solemn pledge not to do so, she signed a separate armistice.

Had the morale of the people of France and that of her fighting forces been sufficient to withstand the early adverse circumstances, the humiliating terms offered by the armistice would have been rejected, and her contribution to our ultimate victory would have been considerably greater.

These examples from the past are sufficient for our purpose. According to the new concept of war, hostilities between nations no longer begin by a declaration of a state of war. War is waged steadily over a long period preceding the use of armed strength and often a nation's downfall is accomplished by insidious propaganda, diplomacy, and economic pressure

followed up by the threat of more forcible measures. Countries are "absorbed" by their neighbors without striking a blow in defense.

### What is Morale?

In view of these examples of defeat by the undermining of the morale of their people, it is of vital importance that we should maintain the morale of the British people at a very high level if we are to survive as a nation. To do so, it is necessary to understand what we mean by morale.

Although inseparable from discipline, the morale of individuals comes from within and is greatly influenced by physical fitness and external discipline. It is produced in individuals by external authority implanting a habit of cheerful obedience within those for whose disciplinary training they are responsible. When individuals are capable of maintaining the same high standard of discipline, after the external authority has been removed, then discipline reaches a degree of permanence. In individuals and groups alike, morale will be high enough to withstand the demoralizing influences with which the enemy will surround them.

Call it patriotism or what you will, the result is a spirit of cheerful obedience to the common good of all. Such a spirit has a degree of permanence that remains unquenched by fear, fatigue, hunger, or sedition. It enables all citizens of a country to rise to heights of achievement and endurance which will bring their country through to victory. This was amply shown by the British people when they stood alone against the superior military strength of Germany. This spirit is called "morale." We can define it in simple language as "an unconquerable spirit of determination to achieve a preconceived aim." The aim of every one of us today is to ensure that no "new war strategy" will be allowed to undermine the morale of the British people.

### Use of Enthusiasm

We must not confuse enthusiasm with either discipline or morale. Although a factor of immense importance and capable of producing astonishing results, it is incapable of sustaining a prolonged effort, fundamentally unstable, and dependent upon external circumstances for its continued existence.

Today, when the whole manhood of the nation is involved in war, we begin with enthusiasm. With this basis behind the shelter of a disciplined army, we transform the enthusiastic, untrained material into an efficient fighting force, with which to achieve our final victory.

Although much has already been written about discipline elsewhere, any analysis of morale would be incomplete without showing how inseparable it is from discipline.

From a service point of view, the simplest definition of discipline is: "That quality which transforms a disorganized rabble into an efficient fighting force."

With "total war" today, this means that the whole nation must be transformed into an efficient fighting force, whether in civil defense, factories, or our armed forces. Therefore, it is vital that we should build up a spirit of willing and cheerful obedience to the leaders among our people. This, in service terms, is discipline.

Discipline cannot be instantly transmitted. It takes some time to build up in bodies of men and women, but it has a quality of permanence. It develops and encourages reliability under all conditions. Habit and custom are the cornerstones of that reliability, and good leadership and justice are the sound foundations on which it is built.

Discipline produces a habit of willing obedience to orders which in itself creates orderliness, avoids confusion, and promotes efficiency. The principal stimulant and active agency in maintaining discipline is the knowledge that it aims at the well-being of the whole nation.



From good discipline comes a high standard of morale which can be gaged by the behavior of individuals under all conditions.

The greatest leaders can do but little with an undisciplined rabble, and so, however strong the inspiration, however imperative the needs, history can show no example of the triumph of a cause whose supporters have not been organized upon a military and disciplined basis.

### The Cold War

In recent years, we have once again seen the new war strategy being used by Russia.

She has time and again used the first three phases of this new concept of war. By propaganda, diplomacy, and economic pressure, she has absorbed neighboring countries one by one, always backed by a powerful army and air force whose very existence was enough to intimidate weaker nations.

During this period, Russia has not hesitated to use these same means against the more powerful Western Powers with the object of forcing them to withdraw from Berlin. It would then only be one further step to drive home the communist wedge and to convert the whole of Germany into another vassal state.

As long as she can achieve her aims without using the last phase of this new strategy (i.e., armed force), she will continue to do so. But is Russia prepared to take this last step?

For months there have been international tension and discord in Berlin. At times, it almost seemed as if an armed clash were inevitable. With enormous forces mobilized, why has she refrained from using them when thwarted by the Western Powers in recent months?

Why wasn't there war in July when we ran the blockade of Berlin by using military aircraft? Is it that because, ever since Lenin in 1918 laid down the com-

munist policy of world revolution, they have been so successful with their propaganda and fifth-column activities, that they will never go beyond the threat of war, backed up by powerful forces to make their threat no empty one?

These are the questions which are uppermost in the minds of the Western world today.

To what extent the Western Powers will allow themselves to be intimidated must necessarily be decided by their preparedness for an armed conflict.

Our preparedness depends not on the efficiency of our fighting forces alone but upon the morale of our peoples. It depends on the extent that Russia has undermined our morale in the past years by employing the new war strategy. We see clear signs of her success in many quarters: nationwide disturbances in France caused by communism; class hatred and unrest stirred up in Britain by Russian propaganda; vast strikes and labor trouble in America due to the same cause. The modern tendency to accept a lower standard of discipline in our fighting forces, with its consequent weakening of morale, is not unconnected with communistic teachings in the past in many of our schools, and with insidious propaganda spread through the homes of British workers from active communist cells in this country.

To what extent our morale has been impaired would not be apparent until the necessity of mobilization for war was imminent.

The British are a curious people and those now greying at the temples and a little thin on top will remember the state of unrest in this country when World War I broke upon us. Civil war threatened in Ireland. The women of this country were rioting in the streets for votes. There were widespread labor troubles. Yet these family affairs were all put on one side when more serious matters arose. Heartening as the thought of this is, we cannot

rely upon it under changed conditions of today. It is vital to our future survival that we prevent the further undermining of our people's morale and take action to weld the nation together, because a house divided against itself is in grave danger.

Finally, a study of the question from the Russian view would assist in deciding whether she will follow up the first three stages of her new war strategy by military pressure when all else fails. The Russians are subservient to strength in others, but ruthless when they possess greater strength than their rivals. In the former case, they will get all they can by cunning bargaining, and in the latter instance, by force.

With the example of Germany and Japan before them and the knowledge that in the space of a few months of war their own fate might be worse, is it likely that they would take such a risk? It is this fear, and this fear healthily developed in the mind of all Russians, which will save the world from another war, the consequences of which are beyond imagination.

As long as the Western Powers are united, their armed forces formidable, and their peoples not divided amongst themselves, it is unlikely that Russia would willingly start a war which, under such circumstances, could only bring the most frightful consequences upon her people.

## The Surrender at Reims

Translated and digested by the MILITARY REVIEW from an article by General Francois Sevez in "Revue Historique de l'Armée" (France) No. 3, September 1948.

ELEVEN months to the day after the landing of the Allied forces in Normandy, Major General Lewis, chief of the liaison mission from the Supreme Headquarters to the French government, called for the chief of the French General Staff of National Defense.

I was charged with the duties of the latter post at that time, as General Juin was attending the San Francisco conference of the United Nations. General Lewis informed me that General Eisenhower desired that I come to his advanced headquarters as soon as possible to discuss certain important matters relative to operations. A plane was at my disposal at an airfield close to Paris to take me to Reims.

I left immediately, accompanied by Colonel Pedron, chief of the Operations Section of the EMGDN (General Staff of National Defense) and by Major Dostert, the American liaison officer.

I was received by Lieutenant General Walter Bedel Smith, General Eisenhower's chief of staff, and was briefed on the latest

developments in the last phase of the war.

On 5 May, the French government had been informed that Marshal Montgomery, commander of the Twenty-first Army Group, had accepted the surrender from Admiral von Friedburg of all the German forces in the northwest.

The following day, General Eisenhower had asked for the presence of a French representative at Reims to inform him that Admiral von Friedburg had been brought to his headquarters and that it was possible that the total surrender of Germany would soon be concluded. The supreme command had insisted on a representative of France being present on that occasion.

I requested that I be allowed to refer the matter by telephone to General de Gaulle, in order to obtain the necessary instructions. This request was denied, it being necessary that the matter be kept absolutely secret. I myself was quite ready to sign the act of capitulation for France if there was an opportunity.

The afternoon passed in nervous wait-

ing. The Allied officers present and I thought that since Germany's defeat had been accomplished, every minute that passed meant useless deaths and suffering for the Allied forces, the civil populations, the prisoners, and the deportees who awaited their release.

It developed that Admiral von Friedburg had not been given authority to sign a simultaneous surrender on both the east-

German forces, he asked for a prompt decision authorizing him to act, even though ratification at a later date by the commanders in chief of the different armies would be necessary.

In reply to this, at 1700, a C-47 brought Colonel General Jodl, chief of staff of the German Army, to the Reims airfield. Meanwhile, my request to send Colonel Pedron to General de Gaulle, to inform



**General Francois Sevez of France signing the surrender document on behalf of the Allies at Reims on 7 May 1945.—US Army photo.**

ern and western fronts. A text of the terms of surrender had been handed him by General Smith. This document had the full approval of General Susloparoff, chief of the Russian mission in France, who represented the Soviet government in all the negotiations. The Allied command demanded that this condition be part of the surrender. Von Friedburg sent a message to Admiral Doenitz stating the condition. Because of the desperate position of the

him of the course of events, had been granted.

At 1800, the German delegation was called to the Headquarters, which was in the professional school of the city. At 1900, General Smith conferred with General Eisenhower, while General Susloparoff was being sent for. At 2000, it was apparent that a new message had been sent to the German government and that there would be considerable delay. The

atmosphere became more and more tense. Soon, the various personalities retired, awaiting a new meeting.

About 0200 in the morning, activity again began. At 0230, I arrived in the map room of the professional school, along with the Russian delegation, General Morgan, Admiral Burrough, General Spaatz, and Air Marshal Robb.

Immediately afterward, General Smith and his Intelligence chief, General Strong, arrived. Finally, General Jodl and Admiral von Friedburg entered the map room. They walked with solemn step to the table back of which stood the assembled Allied officers. They came to the position of attention and bowed.

The room was brilliantly lighted so that photographs could be taken. Marked headquarters maps and statistical tables covered the walls.

When all the delegates were seated, General Smith, addressing the Germans, told them that the documents before him were the surrender documents. General Jodl nodded his head in assent.

The "Act of Military Surrender" was then presented to Jodl and he signed at 0241 on the left side of the document. General Smith signed on the right.

I signed immediately afterwards.

After the signing, General Jodl assumed the position of attention and, addressing General Smith, said: "By this signature, the German people and the German armed forces, for better or for worse, are placed in the hands of the conqueror. At this hour, I can express but one hope: that the conqueror will deal with them generously."

There was no response.

The delegates retired. The Germans were escorted to the supreme commander and were introduced to General Eisenhower, who asked them if they understood the terms of the surrender and were ready to comply with them. They replied in the affirmative, bowed stiffly, and left the room.

A few hours afterward, General de Gaulle issued his victory order of the day to the French people.

## Bomber Offensive

Digested by the MILITARY REVIEW from an article by Air Commodore L. MacLean in "The Fighting Forces" (Great Britain) December 1948.

"You can stand in any one of a thousand places in the larger cities of Germany and as far as the eye can see there is nothing but ruin. Many of those areas will not be rebuilt for generations—if they are rebuilt at all."

Those are the opening words of an article entitled "Thoughts on the Devastation of German Cities," by Leo A. Codd, editor of the American magazine, *Ordinance*. He continues: "Words and photographs are inadequate to describe the degree of damage that has been done to European culture in all the countries where total war from the air was waged."

From the spiritual, he descends to the material and quotes statistics: "To appraise the cost to ourselves in material and in effort, ponder these figures: There were more than 1,440,000 bomber sorties and 2,680,000 fighter sorties flown against the enemy. The cost in dollars to the United States for its part in the air war in Europe was more than \$43,000,000,000."

The cost of the British share, extending as it did over a much longer period, cannot have been less. We thus reach a combined total for the whole air war in Europe of about 84 billion dollars. It would be well, indeed, to ponder on the return for

this prodigious outlay, since the success or failure of a war, like any other form of the business of life, can only be judged on the basis of results accruing in relation to energy expended. Materially, Britain is now bankrupt. Spiritually, "What shall it profit a man if he shall gain the whole world and lose his own soul?"

War is essentially an affair of ethics as well as economics. Though the economical aspect presses heavily on the peoples of the world today, the ethical aspect has continuously occupied the thoughts of mankind. The advocates of "air power," in urging their claims for precedence, took a firm stand, with a foot planted squarely on each of these bases. In comparison with war waged by military or sea power, air warfare, they maintained, would prove not only more humane but incomparably cheaper. It was humane, they argued, because aerial bombardment would not be directed towards the wholesale destruction of humanity but focussed on those few centers vital to national life. Through a dislocation of governmental control and the routine of living, air warfare, they said, would undermine public morale, destroy the will to fight, and cause a collapse at the center regardless of the outcome of naval or military action. Cheaper—because cheapness is, of course, inherent in a short war waged by a small air force whose attacks would be so precisely focussed.

Such was the Air Staff's gospel of war, propagated assiduously throughout some 20 years after 1919. The people of Britain began the war deluded into the belief that this concept was well founded and practicable. About this let there be no mistake or evasive thinking. The simple summary above is the essence and substance of what was fed to the public. It is essentially and substantially what the man in the street believes today. The protagonists of this gospel were acclaimed, not because of their powers of logical deduction from past

events, but because they presumably could prophesy a new era.

### Attacks on Morale

By 1925, the separatist Air Staff doctrine, purely conjectural, had been crystallized. It was officially enunciated by the Commandant of the RAF Staff College as follows:

"If the government had decided that the main effort towards winning the war was to be made by its air power, the object of the Air Force will be to dislocate the national life of the enemy people. The vital centers would then be: the seat of government, transport and communication systems, and the water, light, and food supply."

That the government did decide, at an early date in hostilities, that the main effort towards winning the war was to be made by air power, is easily ascertained by reference to the utterances of such public authorities as Mr. Churchill and Sir Arthur Harris. Sir Arthur Harris, a Marshal of the Royal Air Force, in his book *Bomber Offensive*, writes:

"It is worth while remarking that no other country in the world had at that time (1940) conceived the possibility of using an air force in this way to fight a war by itself and, within certain limits, win a war outright. . . . The general idea at this time (1942), on what civil servants always call a high level, was that the main and almost the only purpose of bombing was to attack the morale of the industrial workers."

Similarly, Mr. Churchill left little doubt on the point. In particular, in an address to Congress in Washington on 19 May 1943, he said:

"Opinion, Mr. President, is divided as to whether the use of air power by itself will bring about a collapse in Germany or Italy. The experiment is well worth trying."

We have from these two supreme authorities that it was the policy of the government, accepted by the Air Staff, that the Air Force should attempt the task of fighting and winning a war by an unprecedented process employing an entirely new technique. This process was to strike direct at the vital centers in the enemy's economy, to use a technique of selective obliteration by means of bombs from the air, and to bring about a collapse of public morale and the surrender of the enemy government through popular pressure.

Since the collapse of neither Italy nor Germany did occur until they were overrun by allied armies, it is unnecessary to labor the failure of this air power experiment, the most costly in history.

Despite this failure, the old soothsayers—unabashed, unashamed, and active—are still making the same prophecies and the bomber doctrine is still booming. It is therefore more than ever necessary to extricate from the morass of propaganda the few pieces of substance and truth.

### Bomber Offensive

In this article, I intend to trace the course of the central bomber offensive. This is not done with a view to emphasizing its self-evident failure but in order to reach some estimate of how much or how little it contributed towards victory.

The indispensable foundation is the ability on the part of the bombing force to hit a preselected target of known importance in the enemy's economic system. The questions demanding an answer are: Did the bomber force in fact possess the required skill? If not, to what extent was this skill lacking and was the Air Staff aware of its absence before the war began?

The first lesson, learned at a desperate price, was that daylight bombing was out of the question. Both Lord Tedder and Sir Arthur Harris leave little doubt about that. Tedder, in the course of a lecture at Cambridge on 18 February 1947, stated:

"Our operations against the German fleet showed up one respect in which we had been wrong. It had been thought that, though the bomber could not by its very nature be as fast as the fighter, yet it could cope with the fighter provided it had sufficient speed and effective defensive armament. The heavy casualties suffered by the raids off Kiel and Wilhelmshaven showed that this was not the case, and from that time on till late in the war the great bulk of our bomber operations over Germany were at night."

Harris states:

"The German defenses were so strong that it was impossible to operate regularly or with any sizeable force by day, so that all our main operations were confined to the hours of darkness."

### Night Bombing

By the time that it had been decided to resort to night bombing as the panacea against slaughter, the bomber force had lost most of its experienced personnel. This may have had a bearing on the extraordinary story revealed by Harris, in his book, *Bomber Offensive*, with regard to the ensuing night offensive.

He shows that from the start the bombers at night could not find, far less hit, their targets. Arising out of this there was subsequently a kaleidoscope of change in the purpose of the offensive, the selection of objectives, general policy, and technique.

From the beginning, the night offensive was doomed on account of unsuitable aircraft, lack of proper night-flying equipment, and inadequate bombs. For example, Harris states:

"... and except in the brightest moonlight, we had no conceivable means of identifying a pinpoint target like a crossroad, or even an average-sized town. At that time, it was almost impossible to hit any inland target by night except when there was a bright moon."



The psychological effects resulting from heavy casualties with no discernible profit began to be felt throughout the Air Force. Harris writes:

"Throughout 1941, both aircrew and ground staff had been getting more and more depressed by the obvious failure of their attacks . . . At this stage, in fact, the whole theory of bombing tactics was being submitted to agitated revision."

The main outcome of this "agitated revision" was the decision to make a virtue of necessity and to abandon any attempt to hit a target such as a factory, a plant, or a railway marshalling yard and to aim at getting bombs somewhere into a given area around such an objective. The whole area was then designated "the target."

The remedy was, in fact, to expand the target to a size sufficiently large to absorb the navigational and bombing errors, and to record a hit anywhere in the area as a bullseye. Such a technique had, of necessity, to evolve along the inevitable line of progressively increasing the scale of attack until such a density of high explosive was decanted into the landscape as to make a probability of securing a hit on the desired factory or other target. Thus, in 1942, we had a force of 956 bombers attacking Essen in order to get Krupps—and failing.

Harris records the failure of this policy: We had to accept the fact, not fully recognized in 1941, that visual indication of targets was impossible except in moonlight and clear weather. This meant that we had, for the time being, to accept a high casualty rate from fighter and *flak*. And we had to accept the fact that the Ruhr was for the time being impregnable."

Harris has told us that, of the aircraft which reported that they had bombed their targets, 75 to 90 percent actually had not been within 5 miles of their targets. During the hearing of a claim before the Royal Commission on Awards to Inventors on 7 September 1948, evidence by Air Vice

Marshal Bennett, of the Pathfinder Force was quoted to show that, prior to 1943, not 5 percent of the total night bomber sorties registered on the correct targets.

As concrete results could not be put before the public, recourse was again had to the abstract—the moral effect of bombing. This was a fairly safe bet, because no one could say that there was no moral effect, and in the heat of war few were concerned to differentiate between "moral" effect and "terror" effect. Moreover, emphasis on "morale" could be increased or diminished as the concrete results waned or waxed.

Thereafter, the Air Staff abandoned even the pretense of making the target an area including a factory or other target, and aimed at simple devastation of cities. Thus, devastation, not the importance of the target to the enemy's economic system, became the gauge of success.

The Air Staff had by now traveled a long way from its original stand on the grounds of economy and humanity. By 1942, such elementary principles of war as the "maintenance of the objective" and "economy of force" had been jettisoned, and with them had gone the last traces of humanity and chivalry. Owing to constantly wavering policy arising out of constantly recurring failure, cost had ceased to count.

The great "experiment" had failed. A nation, subjected to bombing on a scale hitherto beyond imagination, had refused to break under the strain.

Starting from that, the question naturally occurs: When did the bombing of Germany begin to be an effective factor in the war? The obvious answer is: Only when it was closely integrated with military requirements in the over-all invasion plan and undeviatingly directed towards objectives which would positively assist the military operations leading to the occupation of German soil. We must therefore face the cold fact that, for some 4 years, the bombing war was conducted at prodigious

gious cost in money and trained lives, for no positive yield whatever.

### Technical Difficulties

The practical failure is in large measure due to the failure of the Air Staff, in the prewar years, to foresee the correct technical requirements and to provide aircraft and equipment suitable for the task.

The sudden realization of technical shortcomings caused a complete somersault in policy after the Munich crisis in September 1938. Up till then, the greater part of the RAF was being trained to bomb at night. The lack of proper night-flying equipment, the need for which had been stressed for years, compelled the Air Staff to abandon the policy of the night offensive and to throw a completely unsuitable force into a day offensive. We have seen the results. Faced with the extermination of the bomber force if the day policy were pursued, the Air Staff committed again a precipitate reversal back to night bombing.

Even at the end of the war, the British four-engined bomber could not safely venture far over enemy territory by day. Describing a plan for an Allied mass bombing of Berlin towards the end of 1944, Harris discloses that the Americans, on whom we were entirely dependent for escort fighters, were unable to provide sufficient fighters to cover both their own and our bombers. He finishes as follows:

"Although Jimmy Doolittle did his utmost, as always, to meet our requirements, I had to refuse to subject my force to a risk far greater than usual. I had particularly in mind our obsolete .303 caliber defensive armament. The whole operation was therefore canceled."

It is important that the significance of this be appreciated. The American Army Air Corps was equipped to fight and bomb by day. They had long-range fighters—we had not. Their Fortresses carried 12 .5 guns while the British Lancasters' carried 8 .303. We were compelled by reason of

various technical shortcomings to resort to night bombing with a hitting efficiency, during some 3 to 4 years, of only about 5 percent. Nevertheless, the combined Allied effort imposed upon the Germans the need for a 100 percent day and night fighter defense system. This was an incomparably more complex and vast organization than anything we had to devise. This defense crumbled only before an onslaught, whose cost, disregarding the Russian front, was about 84 billion dollars.

Without American industrial resources and American day bombing, what would have been the fate of the night offensive?

The bomber offensive was doomed before it began, because no solution had been found to the problems inherent in hitting a mark from a platform moving at 200 mph. The expedient of plastering high explosive into an area and the subsequent development of technique along that line, did nothing to solve the problems. Bomber Command finished the war as far from precision bombing as it was when hostilities started. With the problem of 200 mph bombing unsolved in 1945, what conceivable prospect is there of precision bombing at 400 mph now?

The true story of the bomber offensive is unknown to the man in the street. The protagonists of "air power," with the forces of the press, broadcasts, and films harnessed to their chariots, will ensure that the ignorance is sustained.

It would be wise for the citizens to realize three things:

1. That the lack, today, of food, drink, clothing, boots, and other necessities is in no small measure due to the prodigious cost of the bombing gospel!
2. That it has been possible for the Air Force, with no roots deep in tradition, to be run on a basis of despotic control!
3. That the protagonists of the bombing gospel are now powerfully and skillfully entrenched in the councils of the nation!

## British and American Training Methods

Digested by the MILITARY REVIEW from an article by Brigadier C. N. Barclay in "The Army Quarterly" (Great Britain) April 1949.

THERE were many material factors in World War II which assisted the Americans to produce vast armies from a numerically negligible nucleus of regular troops. They possessed large areas of uncultivated land where training could be carried out without hindrance to agriculture. They had unrivalled industries based on mass production methods. This enabled them to erect camps and barracks and produce equipment at an astonishing speed. They had a population three times as great as Britain's, and consequently their manpower problem was never as acute as ours. They were also able to benefit from the experiences of other belligerents who had been at war since 1939.

Nevertheless, these and other advantages would have been of no avail if their army leaders had not evolved a sound system for training the masses of men which war placed at their disposal. It was in the sphere of training that American genius for organization on a large scale, their receptiveness to novel methods, and their energy in overcoming difficulties was most conspicuously reflected in the large and efficient armies which they brought to the field in double-quick time.

Their training methods were, in many respects, very different from our own. In view of the excellent results they produced, it is surprising that the American system has not been more closely studied in the British Army. On two occasions, we have had time to produce an army, but in both, the margin of our victory was very slender. Next time, we shall almost certainly have to be much quicker, and in the conversion of masses of civilians into efficient fighting formations, we have much to learn from our American friends.

### British Training

Generally, the training of the British Army is based on the personal relationship between the leader, or instructor, and his subordinates. The unit, squadron, or company commander is responsible for the military education of his officers, NCOs and men. Occasionally, if the subject is highly technical, a specially qualified officer is brought in. In the main, the leader is responsible for teaching everything—tactics, weapon training, physical training, and map reading. Similarly in schools of instruction, the instructors are not usually highly specialized. One officer or NCO is expected to teach a variety of subjects. Students are divided into small classes, or squads, under a permanent instructor who teaches them all but the more highly technical subjects. Although this method is less marked at Army schools than in units, it may be said that the British system as a whole is based on the small class or squad, under a permanent, and not highly technical, instructor or leader.

This system has its advantages. Those being instructed get to know their instructor, and, if he is a good man, they gain confidence in him. He, in turn, learns the character and capabilities of his subordinates or students. On the other hand, it does not ensure the best instruction. A man who has to teach tactics, a variety of weapons, military law, and many other subjects can only be moderately efficient at any one of them. The specialist in tactics, who only teaches tactics, should be not only an expert on the subject, but also he should be able to develop a teaching technique superior to that of the "all-round" instructor.

There is another aspect. Many subjects such as military law, organization, and

administration can be taught efficiently without individual instruction, by means of lectures illustrated by good diagrams or films. Provided the acoustics are good, a lecture delivered to 5,000 students may be just as valuable to each of them as one delivered to 20.

Under the British system, the higher command lays down the general principles on which training is to be carried out and supplements this by periodical training instructions on broad lines. It is, however, the commanding officer of the unit who arranges the details. He is given a very free hand and even some departure from instructions is not frowned upon, provided the results are satisfactory. Again, the system has much to commend it. By giving the commanding officer a fairly free hand, it promotes initiative and gives great scope to the really first-class man. On the other hand, it results in inequalities of efficiency among units. The standard of a unit is very largely that of its commander. Each commander relies on his own experience—which, due to expansion in war, may not be very great—whereas a more rigid system tends to be based on the accumulated experience of many over a long period. If there is a change in command—and changes are frequent in war—the unit may suffer a temporary check while a different system is being started. Similarly, personnel transferred from one unit to another often take time to become accustomed to new methods.

#### American Training

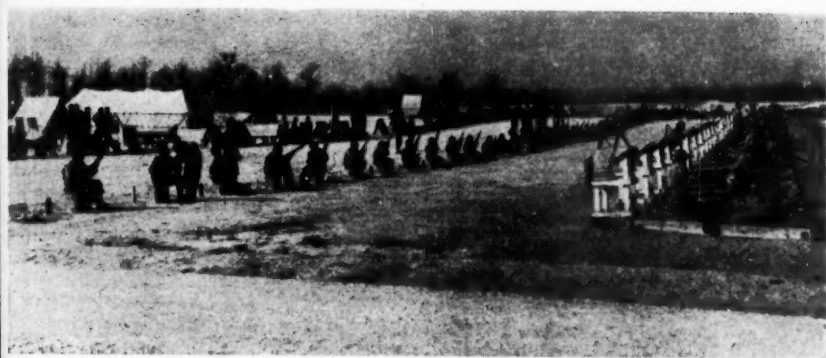
The American system is much more specialized and much more rigid, and this applies to the training of leaders as well as the rank and file, and in schools of instruction as well as in formations and units. They employ the methods of "mass production" in military training as in industry, whereas we employ the methods of the craftsman.

The American military school of instruc-

tion is a highly scientific establishment in which instruction is brought to a pitch of specialization unknown in Great Britain. The system was perhaps more complete in the officer candidate training establishments than in any others. These were much larger than ours—some 5,000 candidates in one establishment being common. They were equipped on a very lavish scale, with separate lecture halls and training areas for each subject. Loudspeakers, films, diagrams, and elaborately staged demonstrations were features of most instruction. The instructors were very highly specialized. Experts were not only provided to teach each subject, but also very often separate branches of a subject were taught by different officers. By means of loudspeakers, lectures and demonstrations were often given to the whole establishment at once. The instructional staff were provided with "fatigue men" on what to us would seem an almost fantastic scale. An American rifle range of about 50 targets would have a permanent range party of perhaps 4 officers and 150 enlisted men.

In formations and units, the system and program of instruction was controlled and supervised by higher authority. From the day a formation or unit was formed, the instruction to be imparted, both individually and collectively, was laid down in great detail. Almost every hour was scheduled, although a few periods each week were allotted to commanders to do as they pleased, the frequency of these being increased as training progressed.

Throughout training, a series of tests were carried out at frequent intervals and the results carefully recorded. These were in the form of individual tests for signalers, drivers, mortarmen, and other specialists, and collective tests—some for endurance, but mostly tactical—for every section, company, battalion, regiment, and division. These tests were conducted by



British training methods are characterized by lack of specialization, close personal relationships, small classes, and considerable latitude for the unit commander. In the United States, the author finds, there is much more specialization and rigidity, mass production in large classes, and lavish use of equipment, aids, and staged demonstrations. Above, a US training center rifle range, showing firing, ready, and waiting lines. Right, a large class, on infantry tactics. Below, a demonstration of amphibious warfare on a beach in Florida.—

US Army photos.



special boards of officers and NCOs, each specializing in a particular subject.

By these means, the training of every formation and unit was kept up to a timed program, and its progress, and probable ultimate standard of efficiency, was always known. It was considered that, provided there was no hitch, it took 1 year to train a division on these lines. The final tests consisted of two divisional exercises, set and supervised by a board, and usually attended by a number of high-ranking officers. If the division attained the required standard on these exercises, it was considered fit for war, although in actual practice it often continued training. Frequently, it joined a task force in the course of preparation for an operation in the Pacific or elsewhere. Here, further training was carried out in cooperation with other formations and probably with the Army Air Force and United States Navy.

Another system which appeared to be common in the American Army was that of having experienced middle-aged officers commanding units during training. These were often retired officers who had been recalled for service on mobilization. They were provided with a young and active second-in-command (or deputy) and it was accepted that the deputy would take over command when the unit went overseas. This ensured that training and discipline were supervised by an experienced officer, while there was a more active and younger commander in battle. The system has much to commend it.

Many American officers deplored the fact that their system of instruction was so highly specialized and their training so rigidly controlled at all stages. When pressed to elaborate their views, however, they almost invariably expressed the opinion that under the circumstances it was the only method of producing a large army quickly. They accepted some disadvantages and loss of efficiency for the sake of speed.

When considering the pros and cons of the American system, and comparing it with our own, the following facts must be considered:

1. The small size of the American peacetime Regular Army and the huge forces which they brought into being made it exceptional for any unit even to be commanded by a regular officer. It was almost unknown for a squadron or company to be commanded by any but a wartime officer. It was quite common for large schools and training establishments to be commanded by an officer of 12 or 18 months' service and for high staff appointments (usually held by a regular lieutenant general or major general in the British Army) to be held by a man of little military experience but well qualified as an organizer and leader in industry. Men with military experience did not exist to fill any but the highest and most important posts.

2. The Americans had an extremely efficient organization—based on that employed in industry—for selecting men for particular appointments. There were very few "misfits" even when men were taken almost direct from civil life to fill a lieutenant colonel's or brigadier general's appointment. Naturally these men could only be successful if they specialized in a limited sphere of military activity.

3. On the whole, the average American is better educated than his British counterpart. Moreover, a high proportion have a definite flare for organizing on a large scale and great energy and confidence in their own ability. These attributes undoubtedly contributed to the success of a system of military training which, without some modification, might have been a failure with others.

The proof of their methods is to be found in the record of their successes in the Pacific, Africa, and Europe.

### Conclusion

The fundamental difference between the two training systems is that the British



Army training is not, by American standards, highly specialized, and frequent tests are not a prominent feature. It is based on one leader, or instructor, being responsible for teaching his men everything—or nearly everything.

The American system is highly specialized. The embryo leader, or enlisted man, under training, is passed from one instructor to another—each a highly specialized expert in his particular subject. The officer, or NCO, who is to lead in battle does not play an important part in the early training of his subordinates, although he may become better acquainted with them as training progresses. A rigid program of work, combined with frequent tests, is an essential feature.

Before a decision can be made on the extent to which the American system can be applied to the British Army, it will be well to examine the problems and difficulties likely to confront us if we are again called upon to mobilize for war.

1. We shall be very near the main theater of operations, and as far as can be foreseen, the tempo of the fighting and speed of events will be even greater than on the two previous occasions.

2. Although we have National Service and, on paper, always have several hundred thousand men under training, the period of service is insufficient to enable these comparatively large numbers to take their place in field formations, or units, ready for action at the beginning of hos-

tilities. Except for the small Regular Army, and possibly a few Territorial units, our field army will require a considerable period of further training.

3. As in the past, we shall be short of qualified instructors for the men called up on mobilization.

To summarize, we shall have no force of any size ready to fight on land, and our problem will be to produce one as quickly as possible.

There can be little question that under conditions in which time is not the governing factor, and small forces are involved, the British training system is the better. It is not suggested that the specialized "mass production" method should be adopted in the Regular Army in peace. It is, however, suggested that it may be a better method for training large numbers in war. If this is accepted, it remains to examine the feasibility of adopting it for the British Army should the necessity arise.

Finally, it can hardly be denied that any means which will enable us to speed up the process of training and deploying large armies for battle is worth considering. It is suggested that American training methods have not received the study which their undoubted success deserves. A "try out" on a large scale, with some of our National Service army recruits, is a course which is quite practicable, and would show to what extent the American system is suitable for training British troops.

## The Belgian Army Education Service

Translated and digested by the **MILITARY REVIEW** from an article by Major Durieux in "L'Armée-La Nation" (Belgium) April 1949.

### Organization

THE Belgian Army Education Service is directly controlled by the director general of special services. It is one of the Adjutant General's services.

The Education Service comprises an administrative board and three services: the civic and professional education service, the editorial service, and the Army Education Center. The Army Education Center

includes a school, an audio-visual aid department, a reference department, and a library.

As stated in the general instructions for the organization and operation of the Army Education Service, it is the duty of the Army to continue the work of the family and the schools by completing the civil education of young soldiers.

The mission of the Army Education Service is to weld the Army and nation more firmly together and to continue the educational effort of the family and the schools. All the efforts of the Service are devoted to making the Army a powerful and active agent in the social evolution of the Belgian people.

The purposes of the Army Education Service are civil, military, cultural, professional, and moral.

1. *Civil*: To acquaint the men with all the moral and material wealth of Belgium; to give them clear and accurate ideas of the various organizations and the many activities of the nation as well as of the great questions of the day; to develop in them a civic spirit and a feeling of national pride in order to make them intelligent citizens who will be more conscious of the personal responsibilities in public affairs and their duties toward the nation.

2. *Military*: To stimulate and improve morale, thus contributing toward developing a voluntary and rational discipline which will increase military efficiency.

3. *Cultural*: To develop and encourage a desire to learn in order to extend personal knowledge in all fields, thus raising the intellectual level of the soldier during the period he is in the Army.

4. *Professional*: To guide men in the choice of a career; within the limits compatible with the requirements of the service, to permit them to prepare themselves for a career or to carry on the studies which they began before entering the service.

5. *Moral*: To cause them to feel, under

all circumstances, the satisfaction which every man gets from moral conduct, which gives him a place and lifts him up in society more than does any exaggeration of dress or language.

### Results Attained

The work of the Army Education Service in civic education is influenced by several factors:

1. The mentality of the actual citizen and his attitude toward the state.

2. The fact that the social and economic mechanism compels the citizen to participate, perhaps against his own will, in public life, and forces him to assume his share of responsibility for the common good.

3. Enemy propaganda.

In the Army, the civic duty is to give the men the will to fight. It is necessary, therefore, to create an educational environment in which an officer will be wholly conscious of his patriotic duty. The men must find in their chiefs the example of what one should or should not do.

At first, the process of education has to overcome indifference and ignorance. Therefore, it is essential that the men should participate in all educational activities.

In civic education, there is no lack of ideas or programs. The program is divided into five parts: The Belgian and the Community; The Belgian and the State; The Belgian, Citizen of an Empire; The Belgian, Citizen of the World; and The Belgian, Responsible Citizen.

Imparting information is the first procedure employed in civic instruction. Orderly, constructive discussion is the preferred procedure in conducting civic education.

An experiment in professional education is being made in 25 nonspecialized units of the Army. The present contingent comprises about 32,000 men. Of these, 19,000 continue to practice and perfect themselves in the trade which they fol-

lowed before they entered the Army. They are railroad enginemen, radio operators, bench hands, cabinet makers, masons, and others. Of the remaining 13,000, some have no trade; others have an occupation which is not used in the Army, such as farmer or textile worker. It is reasonable that the nation should contribute as much as possible—within the framework of military expediency—in giving these young soldiers professional knowledge which may be of use to them in the future. With this in view, provision has been made to carry out the following program:

1. To present professional information by means of lectures, films, and manuals.
2. To provide for the units in which the men will be able to learn various trades outside of duty hours.
3. To present courses in professional education which will be conducted during duty hours. These will include elementary mechanics, household electricity, shorthand, cabinet making, and many others.
4. To provide a professional orientation test, which can be taken by those militiamen who so desire, at the time of their release from active service.

### The Editorial Service

The Editorial Service edits educational manuals which facilitate the work of the education officer. Four series of manuals are now being edited: Swimming, Daily Life, Military Subjects, and Professional Education.

A monthly bulletin deals with subjects for discussion and features all the accomplishments in the fields of culture, economics, and industry. It greatly assists the officers in their role as teachers.

### The Army Education Center

The Army Education Center comprises the following:

1. *A school:* In order to be able to direct the discussion periods in the units

and fit out the information rooms, 30 young officers are instructed every month in the technique of discussion and the other activities of the education officer. After a course of 20 days at the school, they return to their units. From that time on, they carry out the work of the education officer which, at times, is combined with that of the welfare officer. So far, 600 education officers have been trained in the two national languages of Belgium. Information courses for higher ranking officers are also held. These last 8 days.

#### 2. *A department of audio-visual aids:*

The officer in charge of this department is responsible for the creation of all the posters, slogans, caricatures, and maps for the information room of the units. A film, "Heirs of the Past," has been produced. Its purpose is to review the history of Belgium and to emphasize national solidarity throughout the centuries and the accompanying struggle for more liberty. Other films are in the making.

#### 3. *A reference department and a library:*

The Service possesses a large library—more than 3,000 volumes of an educational nature—which is available to the education officers.

In addition, the Service provides each unit with a permanent library of books on general subjects.

The central library serves the education officers, particularly, who find reference material there which is kept constantly up to date. This material serves as a basis for the courses which the education officers conduct and for the articles which they write. This library is no less an aid to the students who, during the time of their courses, find complementary information and reference material for their work.

Lastly, the library is used by the Editorial Service in research for its publications.

The reference department reads a large number of newspapers and reviews, classi-

fies them, and catalogs them in such a way that any education officer may obtain the information he needs on the subject for discussion requested by his classes. These subjects are quite varied.

A library of disc-recordings permits sending musical works to the superior schools of the Army. The Service is likewise charged with the task of subscribing to many newspapers and reviews, regardless of their political opinions.

### Publications

One might ask what is the utility of the publications edited by the Army Education Service.

In order to answer this question, let us return to the mission and the task of the unit education officers.

In each company, there is an education officer who conducts three discussions during every 2-week period. One discussion period is devoted to civic education. It is designed to inform the soldier with regard to the institutions of the state and to teach him his responsibilities with relation to these institutions. The following subjects have been treated in the series, *The Nation: The Belgian Constitution; The National Savings Bank; The Retirement, Life Insurance, and Pension Fund; and the Belgian State*. In this same series, sketches have been given on the activities of Belgium, the world expansion of Belgium, the Belgian Congo, painting and sculpture in Belgium, and monographs on Leopold I, Leopold II, and Albert I.

The two other discussion periods treat subjects chosen by the soldiers themselves. These pertain to matters of everyday life. The manuals dealing with this type of subject have been grouped to form the series called *Daily Life*.

Civilian and military specialists are called on to prepare these manuals. Professors from the Belgian universities, tech-

nicians, members of the Chamber of Deputies, and great industrialists have lent their aid to the Army Education Service.

At times, the education officer does not have sufficient time at his disposal and needs assistance in his task. These little manuals provide the officer with very useful material and save him much time. After reading certain chapters, the education officer easily finds material for a discussion.

Reference material is not all that is needed for the presentation of a discussion. The discussion must be carefully organized. This organization consists of introducing the subject, finding questions which will give rise to an exchange of ideas, and, particularly, in adapting the subject to the class.

These difficulties are eliminated for the education officer through the use of a bulletin published monthly by the Army Education Service.

If the officer adopts this discussion in its original form, he indicates a poor understanding of his task. This bulletin has not been organized for any particular audience. Therefore, the education officer must adapt the subject of the discussion to the mentality of the men of his unit. It must be tuned to their intellectual level.

The monthly bulletin possesses other uses for the education officer. It contains the directives of all the services of the Army Education Service. Articles concerning methods of work, the technique of discussion, audio-visual aids, results obtained in foreign armies, all shed light on several points which are not covered extensively during the courses given at the School.

Lastly, the education officer finds in the monthly bulletin various bits of information, figures, tables, and statistics which may be used in the information rooms.



## FOR THE MILITARY READER

**DOCUMENTARY BACKGROUND OF WORLD WAR II—1931 to 1941.** Compiled and edited by James W. Gantenbein. 1,112 Pages. Columbia University Press, New York. \$10.00.

This collection of important international documents covers the succession of crises in the decade prior to World War II. Nearly 450 documents are printed in the volume, including speeches, treaties, agreements, notes, and diplomatic exchanges. The selection does not attempt to cover every international event, but it deals with all major issues. It includes all the important facets of the foreign policies of the United States, Great Britain, France, Japan, Germany, Russia, Italy, Poland, and Czechoslovakia, as well as the League of Nations, in the steps leading up to the war.

**PROSPECTS FOR DEMOCRACY IN JAPAN.** By T. A. Bisson. 133 Pages. The Macmillan Company, New York. \$2.75.

This book is an appraisal of 3 years of American occupation of Japan, "the greatest single administrative enterprise ever undertaken by the United States outside its own borders." The author reviews the problems faced by the occupation authorities and then discusses the basic objectives of the occupation. Considerable attention is given to political developments in Japan and to economic problems, both of which, the author believes, arise primarily from the efforts of the old ruling oligarchy to preserve its power.

**UNITED STATES ARMY IN THE WORLD WAR, 1917-1919.** Vol. I, Organization of the American Expeditionary Forces. Vol. II, Policy-Forming Documents American Expeditionary Forces. By the Historical Division, Department of the Army. US Government Printing Office, Washington. Vol. I, \$3.00; Vol. II, \$4.00.

These two volumes are the first in a 17-volume series which will record the most significant official documents pertaining to the American Expeditionary Forces in World War I. In the first volume, there is a 50-page summary of the major operations in which the AEF participated, while the rest of the volume deals with the organization of the AEF. Volume II contains the many policy-forming documents affecting the AEF, including General Pershing's instructions of 26 May 1917, the general directive for operations in 1918, the military policy of the United States, and matters concerning unified Allied command. The Historical Division, which supervised the preparation of the series, plans to issue the remaining volumes at intervals of about 6 weeks.

**LEGAL EFFECTS OF WAR.** By Sir Arnold Duncan McNair. 451 Pages. Cambridge University Press, Cambridge, England. \$6.00.

This volume is a detailed study of the legal aspects of war and how war alters the law. It is elaborately annotated with decisions which have been handed down in settling war-induced legal disputes, including World War II cases.

**ASIAN RELATIONS.** Report of the Proceedings and Documentation of the First Asian Relations Conference, New Delhi, India, March—April 1947. 314 Pages. Asian Relations Organization, New Delhi, India. \$4.00.

The Asian countries, while differing from one another in many respects, have a number of common problems which they can best solve by mutual discussion and understanding. This book is the written report of the first meeting of the Asian countries at which their leaders attempted to reach agreement in proposing solutions for their common problems.

**NORWAY, HER INVASION AND OCCUPATION.** By Amanda Johnson. 352 Pages. Bowen Press, Decatur, Ga. \$3.00.

The author of this book confines herself to the task of relating and interpreting salient points in the history of Norway during the period of World War II. In addition to discussing Norway's invasion and occupation by the Germans, she covers the role played by the Norwegian Army, Navy, and Air Force on the allied battlefronts, the activities of the Free Norwegian Government in London, and the struggle against Nazis and Nazism on the home front. The final reckoning with the German war criminals upon the termination of the war is also outlined.

**THE ECONOMIC RECONSTRUCTION OF EUROPE.** By Geoffrey Crowther. 79 Pages. Claremont College, Claremont, California. \$2.75.

This book is the printed version of three lectures entitled *The Vitality of Europe*, *Freedom and Order in Europe*, and *America and Europe*. The economic dilemma in which Europe finds itself as a result of World War II is outlined, and the steps to be taken in remedying the situation are presented. Crowther is editor of *The Economist*, London.

**THE DOMESTIC MINING INDUSTRY OF THE UNITED STATES.** A Critical Study of the Economic Mobilization of the Mineral Base of National Power. By John Davis Morgan, Jr. 420 Pages, Appendices and Index. US Government Printing Office, Washington.

This is a detailed, documented study and evaluation of the mining industry of the United States in World War II. The author analyses the confusion of governmental agencies which dealt with mining during World War II and the lack of a well-defined chain of command. As to manpower, there was a shortage of skilled miners, little training was undertaken, and there was confusion in drafting miners. Production of coal suffered most from strikes and the drafting of younger workers. Mining, the author points out, depends greatly on transportation facilities, and stockpiling and alternate facilities would help reduce future transportation vulnerability. Underground facilities are treated only briefly, but the point is made that planning and construction must be done before a war starts. Prior to Pearl Harbor, the United States assisted its future enemies in obtaining necessary minerals, and the author declares that even now no precautions are being taken to deny technical mining information to potential enemies. Among the author's major conclusions are the following: That in a future war, mining will require government regulations, with a well-defined chain of command; the mineral industries of the Western Hemisphere should be coordinated; essential materials should be stockpiled in advance; damage to the transportation system would seriously affect mining; universal service is the solution to the manpower problem; the greatest reservoir of skilled underground constructors is in the mining industry; and there should be mineral specialists in the Central Intelligence Agency.